Chemical Week

April 30, 1955

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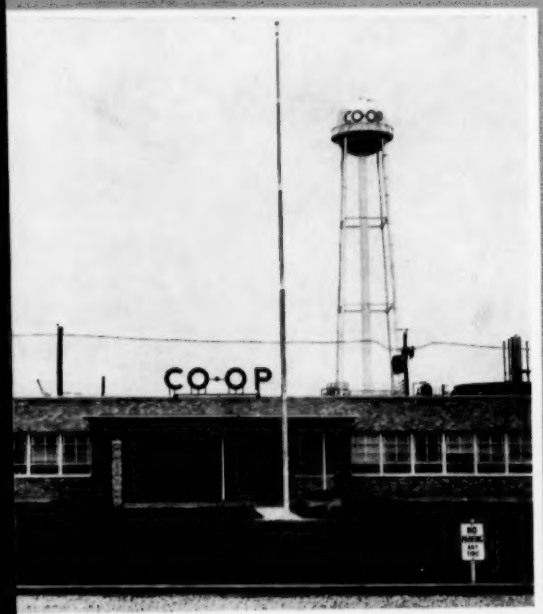

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Hot oil is the key to a new fresh-water-from-salt process; but is it feasible? . . . . . p. 42

"Liquid tile," do-it-yourself household product, boosts prospects for polyesters . . . . . p. 52

Target: rubber-to-polyurethane adhesive; when it's found, look for a 100,000-mile tire . . . . . p. 64

Versatile, relatively cheap, but tricky-to-handle acrolein makes bid for large-scale use . . . p. 82

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Fig. 2309—Flush Bottom Tank Valve for 150 Pounds W. P. Disc Opens Into Tank.

FIG. 2342—Flanged End Bolted Cap Swing Check Valve. For 150 Pounds W.P.

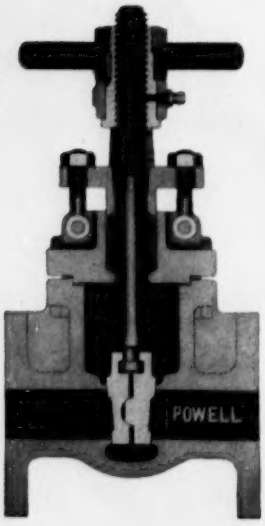

FIG. 2495 (Sectional)—Stainless Steel O. S. & Y. Gate Valve For 150 Pounds W. P. Double Wedge Disc Is Accurately Guided Into Seat.

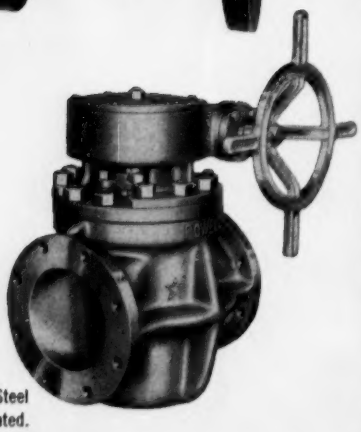

FIG. 3059-G—300-Pound Steel Lubricated Plug Valve. Gear Operated.

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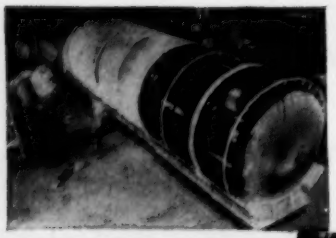
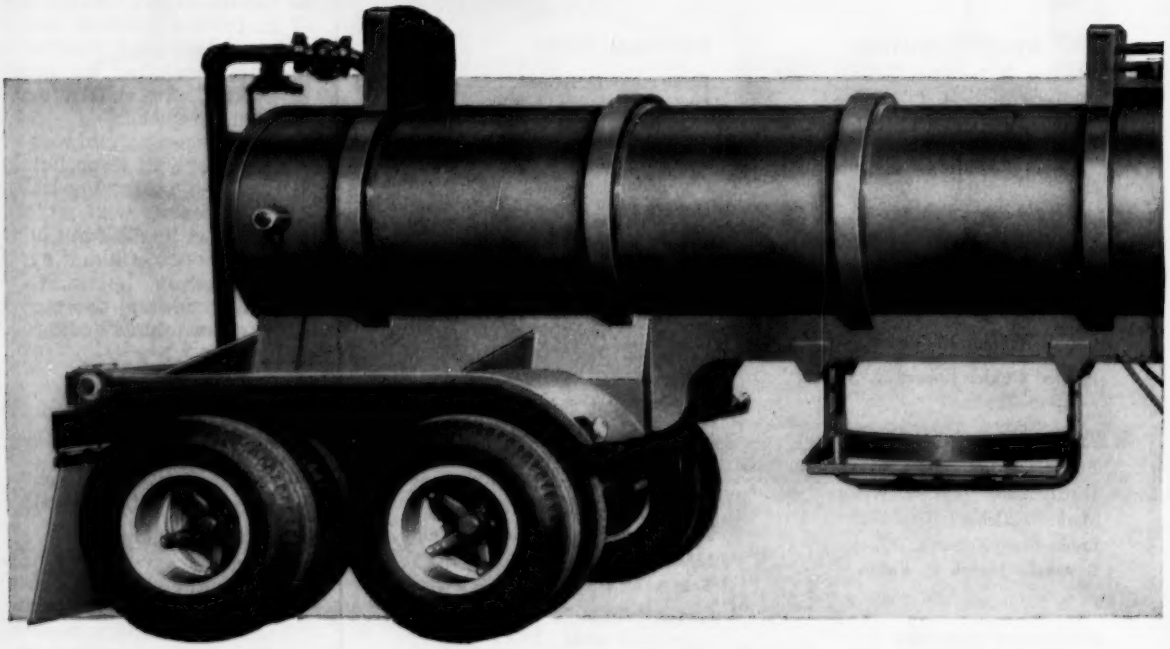


New Trailmobile Acid ...no sacrifice

Rigid and continual inspection during assembly of Trailmobile Acid Tanks assure long service life, safe operation.

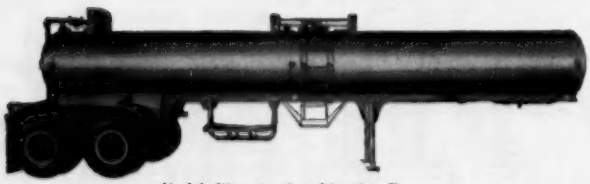
Continuous automatic weld areas can be seen on new acid tank under construction at Trailmobile's exclusive tank manufacturing plant, Springfield, Mo.



You can haul more in Trailmobile's new "slimmed down" Model CH Acid Tank Trailer. Model CH is lighter by thousands of pounds, without sacrifice of structural strength, load safety or road handling ease.

Trailmobile's weight-reducing secret is a strong tank shell of 3/16" A.S.M.E. Code Steel, girded by husky "rings of steel." Strong channel members (we call them exterior rings) are welded integrally to the tank shell and sturdy supporting frame members. Result? Overall structural strength equal to all previous regulations! Amazing weight reduction!

This exclusive new Trailmobile Model CH design (approved by I.C.C. Specification MC-311) gives operators extra payload carrying capacity of over 100 pounds for every 100 gallons of capacity built into a tank. A 3000 gallon capacity

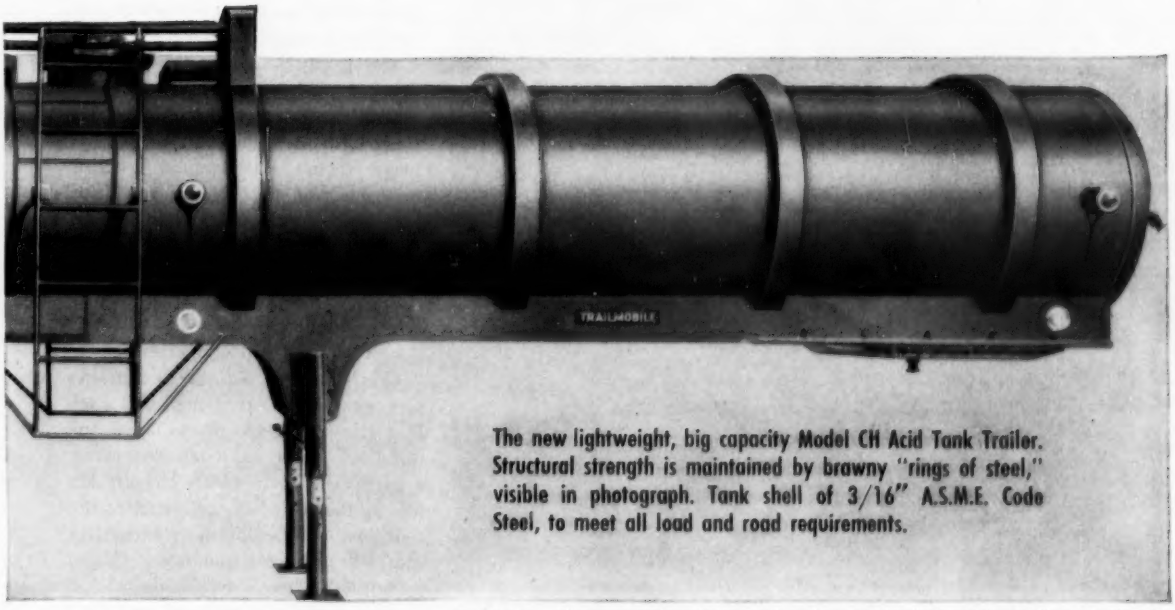


Model CH — insulated (optional)

Trailmobile continues to build heavier gauge tank trailers. Acid tanks are available in many sizes, shapes and designs with special and optional equipment to handle exact hauling problems. Ask about these special tanks.

Tank Gives 3000 lbs. more payload in structural strength or road safety

Available in A. S. M. E. Code Steel or Stainless Steel



The new lightweight, big capacity Model CH Acid Tank Trailer. Structural strength is maintained by brawny "rings of steel," visible in photograph. Tank shell of 3/16" A.S.M.E. Code Steel, to meet all load and road requirements.

Available with unground welds at reduced cost. Also built with stainless steel tank.

tank weighs almost 3300 pounds less than before. You get a bonus of 3300 pounds more payload! What's more, the new Model CH acid tanks encompass every money-saving performance feature of previous Trailmobile models: Walkway mounting brackets; adjustable fifth wheel; full Class A vapor-proof enclosed wiring; wide tunnel drains for easy cleaning; the famous Trailmobile tandem, with 4′, 6′ and 9′ options.

Trailmobile manufactures the Model CH Acid Tank in either stainless or black steel, and with a variety of coatings and linings to handle all types of corrosive and non-corrosive fluids. So whatever your acid hauling problem, see Model CH before you buy. It's your assurance of increased hauling capacity, with utmost safety, economy and profit.

For full information and quotations on the Model CH and other Trailmobile acid tank trailers, mail coupon today. Or call your nearby Trailmobile Branch Office, listed in the yellow pages of your telephone directory.

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Behind The News

Dear Sirs: I am writing my term paper. Please send me all the information you have on antibiotics. Thank you very much.

Thomas Edwin Rankin Jr.
Cumberland, Va.

Letters like this are just as trustworthy as the calendar in telling us that spring is here—and just as warming. For, although we accept no subscriptions from students,* we're commandeered at this time of year to buckle down on "term paper projects." And, with a wisp of nostalgia, we take on the charge.

Requests of this nature are, of course, not typical of our morning mail. They're just a seasonal spicing. Rather, 99.9% of the letters we receive are from you—*CW*'s readers; or, as we often say, "*CW*'s readers and outside editors". That's a term we use justifiably: your letters point up just how closely you read the magazine. But more important, from our standpoint, are your comments, the opinions you express, the judgments you render, the questions you ask. They mirror your current interests and your pressing problems, and thereby exert a real impact on the editorial course we chart.

Your letters sparkle with variety—a fascinating variety. You tell us promptly (often by telegram) what you like or dislike; you chide or commend, agree or disagree; you volunteer additional information on subjects we have reported on; you tell us quite frequently of newsworthy developments within your own companies. And every now and again you suggest that we look into this or that.

Not all our incoming mail is, of course, mellow. Sometimes it bristles with criticism ("I don't see how you could be so stupid as you are to even mention fluoridation of water. It is just a plot being foisted on the public by some vested interests and a short-sighted government. It will undermine the health of millions of people and make them addle-brained"). However, most of the criticism you direct at us is constructive and helpful. That's why every letter is read carefully by *CW*'s editors, why all are studied and appraised. They constitute a pulsebeat, as it were, to which we attune a stethoscopic editorial ear.

Oddly enough, we can seldom predict when the flood of mail will swell to tidal-wave proportions. There are, to be sure, some letter-sensitive areas: a bare mention of tariffs triggers letters by the score; any reference to the shortage of technologists or executives results in our being inundated. (Usual contention: there's no shortage that higher salaries and thorough appraisal of the on-the-job juniors wouldn't clear away.) But by and large we are always encountering surprises. A single phrase, a casual sentence or two, often sets hundreds of readers reaching for their Dictaphones.

We have, unfortunately, room to publish only a very small percentage of your thoughtful letters. But, as I mentioned, all *CW*'s editors welcome your views and the counsel they accord. And you may be sure that every letter is answered.

P.S. A second note from Thomas Edwin Rankin, Jr., tells us that he received the material on antibiotics, is now well along with his term paper.

Editor

*Because *CW* is edited solely for chemical management men, we restrict our circulation to executives. We neither solicit nor accept subscriptions from students. But many youngsters—who seem to boast some laudable "executive qualities" (ingenuity, imagination, foresight, delegation of responsibilities)—seek out our address and elicit our aid.

NEWSLETTER

In the wake of annual meetings last week, some chemical company executives are wondering if all the enthusiasm stirred up over record sales and earnings for the first quarter (consensus: Jan., Feb. and March '55 add up to the best first quarter in the nation's economic history) will boomerang by year's end. Stockholders in company after company were greeted with solid predictions of record profits this year.

What's worrying company leaders, however, is this: though they admit there's little chance of a downturn in the immediate future, the chemical industry can't expect to maintain the fast pace it's set in the first three months. Some slowing of the rate certainly is likely—and stockholders, expecting a bonanza year, are going to be hard to convince that the deceleration is a healthy sign.

•

Political leaders of both parties are also realizing—somewhat belatedly—that the growing snafu over distribution of the Salk polio vaccine may develop into more than a fair-size headache.

In all the festivities over news that the vaccine was a success, overoptimistic predictions on availability of supplies of the serum were voiced by government and local governmental officials. All six of the producing pharmaceutical firms tried to put a damper on rash promises of immediate deliveries—but their warnings were lost in the general melee.

Now, faced with a situation that could prove to be political dynamite, government representatives are privately blaming the National Foundation for Infantile Paralysis for the "disappointment"; several vaccine producers are wondering anxiously where the finger of accusation will point next.

•

IG Farben successor firms are expected to suggest to their shareholders in May that a move should be made immediately to remove certain statutes prohibiting any "connection" among the former splinters of the former German cartel. These statutes were established by the Allies in the course of decartelizing activities.

First step will probably be taken May 27 in Frankfurt—at the first public meeting of IG stockholders since the conclusion of Allied decartelization supervision—when the liquidators will present an extensive 100-page report on Allied deconcentration as well as on regulations concerning IG property. Also on the docket for consideration: election of at least one former executive of the old IG Farben administration (expelled by the Allies) to the board of directors of one of the major successor companies.

•

It looks now as though the U.S. is off to a flying start in its acknowledged effort to maintain a commercial position in India against the combined might of Iron Curtain countries. Making its first sortie into Indian trade fairs, the U.S. government has nailed down the largest single allocation of space—100,000 sq. ft. Private business will be invited to participate in the six-week show—due to open in New Delhi on Oct. 29.

Firestone Tire & Rubber Co. plans to take advantage of its opportunities, too, will launch a $1.2-million expansion program at the two synthetic rubber plants it purchased from the government last week. Annual capacity at Lake Charles will be increased 13%; output at Akron (rated at 30,000 tons/year of GR-S) will be stepped up.

•

In Russia, last week, the chemical industry was roundly chided again—this time for paying its workers too much money for output achieved.

During the first nine months of 1954 alone, the official government mouthpiece *Izvestia* charges, "overexpenditures of the wage fund by chemical enterprises totaled 23.3 million rubles" ($5.5 million). One of the worst offenders: the Karaganda plant of the U.S.S.R. Ministry of the Chemical Industry, which paid its workers 105.2% of its wage assignment while turning out only 78.6% of its production quota.

•

Knocking on the door ever more impatiently is atomic power; and the word this week is that Foster Wheeler Co. says it's ready to design and build—for completion by 1960-61—a "long-run," low-cost atomic power plant that will be competitive with some conventional power stations.

F-W's Nuclear Power Project says the proposed plant would cost about $21 million, would have an output of about 100,000 kw., and its electric costs could be as low as 6 to 9 mills/kwh. The reactor would use a solution of uranyl sulfate in heavy water, which would be pumped through four heat exchangers wherein fission of uranium-235 would yield enough heat to produce saturated steam at 600 psi. A breeder blanket containing thorium-232 would refuel the reactor with uranium-233, and also produce additional heat and steam.

For chemical companies, there'd be at least three jobs open: preparation of the uranium fuel, preparation of the breeding material, and processing of the radioactive waste products.

•

First chemical process company to be hit with a guaranteed annual wage demand: Parke, Davis & Co., Detroit pharmaceutical house, which was threatened with a strike last weekend just as another union was ending a three-month strike against nearby Wyandotte Chemicals Corp. Apparently inspired by its "big brother" CIO auto union, Local 176 of the CIO's new Oil, Chemical & Atomic Workers Union is asking a GAW plan similar to the one presented to Ford and General Motors in current negotiations. Local 176 also wants a 10¢/hour wage increase.

The situation is complicated by the fact that Parke, Davis is one of the six firms now turning out Salk polio vaccine, and is trying to produce as much as possible for use before the summer polio season. P-D has offered wage rises ranging from 3½ to 4½¢ and a pension plan "better than those in the auto industry," but says it's in no position "to pioneer GAW for the country."

•

Top laurels in reinforced plastic consumption among automobile makers so far this year go to Chrysler Corp.—using more than 26 tons/day, mainly for car-heater housings.

Last year Chrysler consumed some 5.2 million lbs. to become one of the nation's largest industrial users. Total U.S. output of reinforced plastics last year was some 26 million lbs.

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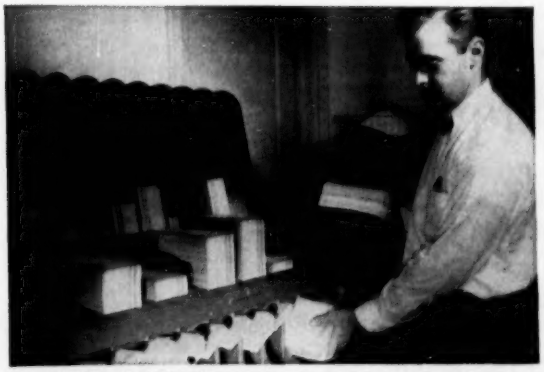

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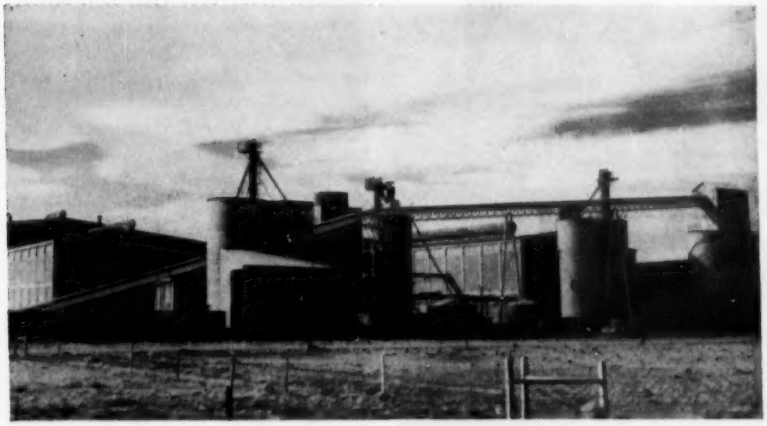


ALUMINA PLANT IN WYOMING: On sale to cement firm, rival sets off . . .

Furor over Bidding Cutoff

Management is still eager for the federal government to get out of chemical processing and other commercial-type ventures, but one company's experience as buyer of a government-built alumina plant may cool industry's ardor to buy out such operations.

The alumina plant at Laramie, Wyo. —purchased by Ideal Cement Co. of Denver for $1.2 million—is idle this week while a Congressional committee makes up its mind whether the sale should go through. Company Vice-President Cris Dobbins says Ideal can't afford to keep the plant going with the title not cleared.

The reason that a special subcommittee under Rep. Jack Brooks (D., Tex.) is checking into the sale is that a rival concern—Monolith Portland Midwest Co. (Laramie)—has been protesting that it wasn't given a chance to raise its bid above Ideal's top offer.

Three Bids Called: In their original bids, there was a wide spread between Ideal's $1.05 million and Monolith's $545,000. On a second go-round, Ideal stood pat and Monolith went up to $600,000. The agency conducting the sale—the General Services Administration—then called for bids again, and got offers of $1.2 million from Ideal and $1.11 from Monolith. Here bidding was halted, and GSA handed the plant to Ideal. Monolith insisted that it wanted to bid again, but GSA said bids had been bounced around enough.

Ideal—which says it fully expects to get clear title to the plant eventually—is planning to use the facilities for production of lightweight aggregate to take the place of sand in cement. GSA has stipulated that the plant can't be used for making cement itself. The agency also is requiring that the alumina clay facilities remain intact for 10 years, in case the government should suddenly need increased aluminum output. As far as peacetime alumina operations are concerned, the Laramie plant is considered by some as economically unfeasible, although Monolith says it would continue the alumina processing

Brooks' committee is expected to make its decision any day now; and as of this week, the scales seem to be tipping toward a recommendation to let the sale stand. Or, the committee may not make a recommendation, and this, too, would back up GSA's action. Meanwhile, Ideal is losing out on use of its investment in the plant.

New Pitch, Old Theme

The perennial question of whether scientists and engineers should have to serve a full term in the Army came up before a Congressional group again last week.

A House Armed Services subcommittee is considering a bill by Rep. Carl Hinshaw (R., Calif.,) that would allow scientists to go back to civilian jobs once they had completed 90 days' training.

The bill, which has the support of such scientific organizations as Scientific Manpower Commission, would set up a scientific specialists board to consider whether drafted engineers, scientists and technicians would be "actually or potentially more valuable" as civilians. In such cases, the man involved would be discharged once he has completed three months' basic training, but would be liable for later recall if he changed his job, or if he failed to make periodic reports of his work to the board.

Little Hope: Chances of the specific bill becoming law, however, are almost nil. The Administration opposes it on the grounds that its new draft-and-reserve plan requiring six months' training, followed by some years of reserve status, would eliminate the problem.

While Hinshaw admits that his legislation stands little chance, he feels that some members of the subcommittee considering the bill may add some of its principles in the overall national reserve measure.

There's a chance, too, that such principles might be written to apply to more than strictly scientific personnel. Some Washington scientific observers—who are in a minority—feel that it is unwise to perennially ask favors for scientists, setting them out as a special privileged class. They feel a better solution would be to establish a National Manpower Board to consider whether specialized personnel of every type would be better utilized as civilians or in the armed services.

LYN CRAWFORD-MC GRAW-HILL

REICHHOLD: Making another bid for Catalin directorship, he finds that . . .

This Time, the Door Opens

In what might be described as a "torrid" annual meeting in New York late last week, Henry Reichhold, board chairman of Reichhold Chemicals, Inc., finally won his battle to sit on Catalin Corp.'s board of directors. Only five months ago, Reichhold's surprise bid for a seat on the board of directors got "thumbs down" from Harry Krehbiel, Catalin's president (*CW, Nov. 6, p. 11, '54*).

By last week, however, Catalin's management had reconsidered, reversed its stand, and unanimously recommended that stockholders vote Reichhold in to fill a board vacancy.

All stockholders, however, weren't easily persuaded as to the sagacity of the move, voiced plenty of noisy opposition, fearing "it might endanger Catalin's future." One reason given: Reichhold and Catalin are "direct competitors" in some items—namely phenolic and urea resins.

Asked by one vociferous stockholder if he thought being a director of Catalin would profit the company, Reichhold calmly replied, "I'm a stockholder, too. I certainly wouldn't be investing in a company I thought wasn't going to make money." Reichhold admits holding close to 10% of Catalin's shares, making him the largest single stockholder.

Reichhold's particular interest in Catalin is polystyrene and oil additives (54% and 12% of total sales, respectively). He's already on record as saying those Catalin products are "especially capable of profitable development." In addition: Catalin itself is planning to diversify into alkylated phenols, and other fields less competitive than polystyrene and liquid resins.

Though Catalin's financial position last year left much to be desired by stockholders, it's improving now. Net sales for the quarter ending March 31 totaled $4.29 million, compared with $3.99 million last year.

Second-quarter earnings should get an additional boost from Catalin's newly leased (to Dow) polystyrene plant (Calumet City, Ill.). Estimated lease profit: $13,000/month before taxes.

Professional Advice

Administration of the U.S. antidumping law will be further tightened up as a result of a study of antidumping procedures now being made for the Customs Bureau by McKinsey & Co., a New York management consultant firm.

This should result in additional safeguards against foreign dumping for the U.S. chemical industry. Ever since the Germans tried to smother it after World War I, the industry has feared this practice. Its traditional fears were suddenly reawakened by the recent revival of German chemical production. Result: industry leaders have been complaining frequently that the U.S. antidumping law of 1923 was all right in theory, but that loose administration left a lot of loopholes in practice. (They cite, for example, the case of East German potash dumping, which ran unchecked for some time.)

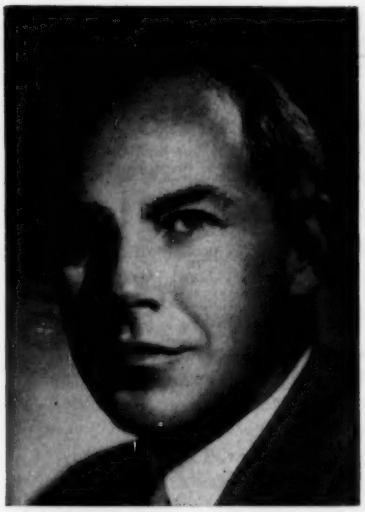
The current study follows on the heels of a Customs Bureau move to clarify the definition of what constitutes dumping. The McKinsey report, however, will concentrate on the mechanics of administration—everything from personnel policies to office routines and procedures to detect dumping. Both moves are designed to accelerate handling of cases as well as to close loopholes in present procedures. Any speedup that is achieved will help importers accused of dumping as well as the possible victims of it. Importers have complained in the past that importation often has been blocked for months while cumbersome antidumping investigations were under way.

Turnover Starts

First synthetic rubber plant to be transferred to private ownership under the Rubber Producing Facilities Act of 1953 was the Baton Rouge, La., butyl rubber units bought by Esso Standard Oil Co. for $16 million.

The exchange took place last week at formal ceremonies on the site, attended by local, state and federal representatives.

The Baton Rouge plant has a capacity of 47,000 tons/year of butyl rubber; total U.S. capacity is 90,000 tons. Construction was actually started by Esso before Pearl Harbor; in April '42, however, the plant was transferred to government ownership.



RESEARCHER BARNES: On polypyrrolidone, he feels 'left out.'

Proof of the Pudding

Charging that he has been cut off from the fruits of his research work, a former director of research for Arnold, Hoffman & Co. is suing that company and its major owner—Imperial Chemical Industries, Ltd., of London—for $3.3 million.

At issue in this case: polymers of pyrrolidone, and their ultimate value in commercial applications.

Carl Edmund Barnes, in bringing this action in New York's U. S. District Court, asserts that the work he directed on polypyrrolidone constituted "a significant invention and discovery in the field of plastics [that] filled an important gap in the outstanding nylon patents."

ICI says it can't comment on the charges until it's officially notified of the suit. It's understood that filing of the action followed an unsuccessful attempt to negotiate a settlement.

Matter of Opinion: At present, it seems, the potential value and usefulness of polypyrrolidone are matters of opinion. Within ICI, there appears to be considerable doubt about these synthetic resins; and in the U.S., industry sources figure much more development work is needed.

Privately, Barnes indicates to *CW*, he agrees that more research is needed for commercial application; but he insists that the material should turn out to be at least as useful as the German plastic, perlon, to which he says polypyrrollidone is closely analagous.

Antitrust Strategy: Although Barnes contends that Arnold, Hoffman did not live up to the promises it made when it hired him as research director in Dec. '49, he's not using a breach-of-contract action. Instead, Barnes' attorney—Bennett Boskey of Washington, former deputy general counsel of the Atomic Energy Commission—has filed an antitrust suit.

The complaint relates that Barnes—who holds a Ph.D. in chemistry from Harvard, and who had worked up to the position of associate director of research at General Aniline & Film Corp.—was hired to head up an expanding research program at Arnold, Hoffman's plant in Providence, R.I. Barnes says he was told that the contemplated affiliation with ICI would lead to further enlargement of A-H research operations.

In 1951, Barnes and associates William Ney and William Nummy applied for a patent on polymers from pyrrolidone, and this patent (No. 2,-638,463) was issued May 12, '53, and assigned to A-H. Other applications in this same field, the complaint states, are still pending.

Monopoly Charged: In 1950, ICI gained controlling interest in A-H, and—according to Barnes' complaint—decided to transfer all polypyrrolidone research to ICI's British laboratories "to obtain more extensive monopoly control over polypyrrolidone, to stifle utilization of technical information in the U.S., and to place ICI in a more favorable position as to market and price control."

In so doing, the complaint sums up, the defendants "entered into a conspiracy for restraint of trade" in violation of the Sherman and Clayton Acts; and Barnes—who says his A-H employment was terminated May 22, '53, just two weeks after he had signed papers assuring A-H and ICI of full control over the inventions—alleges that he has been wrongfully excluded from further profitable endeavor in polypyrrolidone research. He puts his damages at $1.1 million, and asks recovery of triple damages plus costs.

It's likely enough that Barnes—who now is director of central research for Minnesota Mining & Mfg. Co. (St. Paul)—may be able to prove some of his allegations, but if the "proof of the pudding" adage still holds, it may be harder to prove in advance just how valuable polypyrrolidone will be.

SENATOR GEORGE: Can be counted on for strong support to . . .

Holding the Line

It's still touch and go on tariff legislation in the Senate this week with no real indication as to where the ball will finally bounce. Reason: as the contest in the Senate Finance Committee came down to the wire, decisions made there were still not conclusive. Both sides (for and against President Eisenhower's program to extend reciprocal trade for three years with new tariff reduction powers) were equally confident that their side would win out when the full Senate vote is taken—probably next week.

In committee, the Administration actually accepted three minor changes in the bill in order to win solid support from wavering Southern Democrats. Result: major amendments were defeated by one-and two-vote margins.

The key question was whether there would be committee approval of a suggestion made to curb imports of oil, lead and zinc, fluorspar and hardboard. Congressional experts estimated that had any of these been accepted by the committee it would have been impossible to keep the bill from being loaded down on the floor with amendments to restrict imports of other commodities.

In scraping up Senate votes, the Administration will get strong support from Sen. Walter George and from Sen. Harry Byrd, chairman of the Finance Committee. President Eisenhower himself will go all out to rally the Republican support.

Hot Fight Looms: The floor fight is bound to be long and bitter, however, since in the Senate there are no limits on debate and virtually every senator with an industry threatened by imports in his state will want to have his say. You can't even rule out a filibuster by die-hard protectionists. Therefore, May 15 is rated as the earliest date for final Senate vote.

An ironic fact about the Finance Committee's final vote on the tariff bill was that it was saved from mutilation by the most protectionist-minded member of the committee, Sen. George Malone of Nevada. He voted against a proposal to cut the duration of the bill to two years and to limit the President's tariff-cutting authority on the grounds that he was opposed to any tariff cutting and therefore couldn't vote merely to limit it. The vote was 8-7 against the amendment.

COMPANIES. . . .

First order of business for newly formed Sohio Chemical Co. will be to market the products of Standard Oil Co.'s (Ohio) $17-million petrochemical plant, under construction at Lima, O. Initial products will include: anhydrous ammonia, urea, nitric acid and nitrogen solutions. Estimated date of the plant's completion: Nov. '55.

•

Recent company incorporations:

- In Cincinnati, Green Belt Chemical Co., with authorized capitalization of $200,000.
- In Dover, Del., Standard Lithium Corp., with authorized capital stock of $20,000.
- In Asheboro, N. C., Timely Products, Inc., with authorized capital stock of $100,000; and Textile Fibre Spray, Inc., also with authorized capital stock of $100,000.

EXPANSION. . . .

Insecticides: Stauffer Chemical Co. will build an insecticide plant at Omaha, Neb., on the Missouri River. No cost or estimated date of construction has been revealed.

•

Ammonia: St. Paul Ammonia Products, Inc. will build a $15-million ammonia plant at Pine Bend, Minn. Plans to start construction were launched almost immediately after Judge Robert C. Bell (St. Paul federal court judge) dismissed a suit against St. Paul Ammonia, in which a group of farmers had challenged the legality of rezoning the plant site to industry. Estimated plant capacity: 200 tons/day.

•

Nitric Acid: Spencer Chemical Co. (Kansas City, Mo.) will expand its nitric acid and ammoniating solutions units at Vicksburg, Miss., at a cost of $1.5 million. At present the Vicksburg plant has sufficient nitric acid capacity to convert 60% of the anhydrous ammonia produced at the works into ammoniating solutions. Spencer still intends to market a portion of its ammonia produced at Vicksburg, but the new expansion will permit (if and when desired) conversion of all ammonia production into solutions.

Completion of the expansion project is expected by July '55.

•

Titanium Tetrachloride: Columbia-Southern Chemical Corp. plans to build a multimillion-dollar titanium tetrachloride plant at Natrium, W. Va. Primary grading work is already under way; the plant is scheduled for partial production by April '56.

•

Mercury: Rare Metals Corp., subsidiary of El Paso Natural Gas. Co., will build what is claimed to be the largest single rotary kiln mercury recovery unit in the world. Site: Weiser, Idaho; capacity: 170 tons/day.

The company has already exercised its option to lease mercury properties near Weiser, intends to maintain an open-cut mine on the property.

•

Solvents: Canadian Chemical Co., Ltd. will start production of methyl isobutyl ketone, methyl isobutyl carbinol, methyl ethyl ketone, 3-methoxybutanol and 1,3-butylene glycol at Edmonton, Canada, by midsummer.

The company predicts that its output of most of these solvents will make Canada self-sufficient for the first time.

•

Styrene Monomer: Foster-Grant Co., Inc. will double capacity at its Baton Rouge styrene monomer plant to provide more than 50 million lbs. of styrene annually.

Needed: A Commercial Market

DESPITE THE STATEMENT last week by Jesse C. Johnson (Raw Materials Director, AEC) that the free world now has sufficient uranium resources to meet its needs, prospectors are flocking westward in ever-growing numbers.

Here in Bakersfield, Calif., a claim map is posted, draws an eager crowd of would-be strikers.

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The low price and high-level performance of Enjay Butyl allow it to replace natural and other rubbers now used in industry. Enjay Butyl is the rubber that combines high resistance to aging . . . abrasion . . . tear . . . chipping or cracking . . . ozone or corona . . . chemicals and gases . . . heat . . . cold . . . sunlight . . . and moisture.

The new Enjay Laboratories, located at Linden, New Jersey, are equipped to provide expert technical assistance in compounding and adapting Enjay Butyl to individual uses and requirements.

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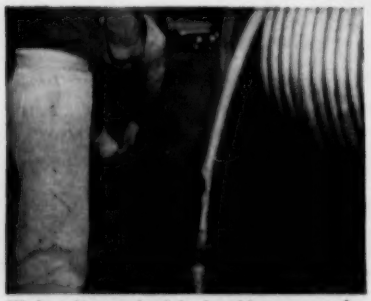
Inner tubes are made of BUTYL because BUTYL holds air ten times better than natural rubber. Its impermeability to gases promises many uses.

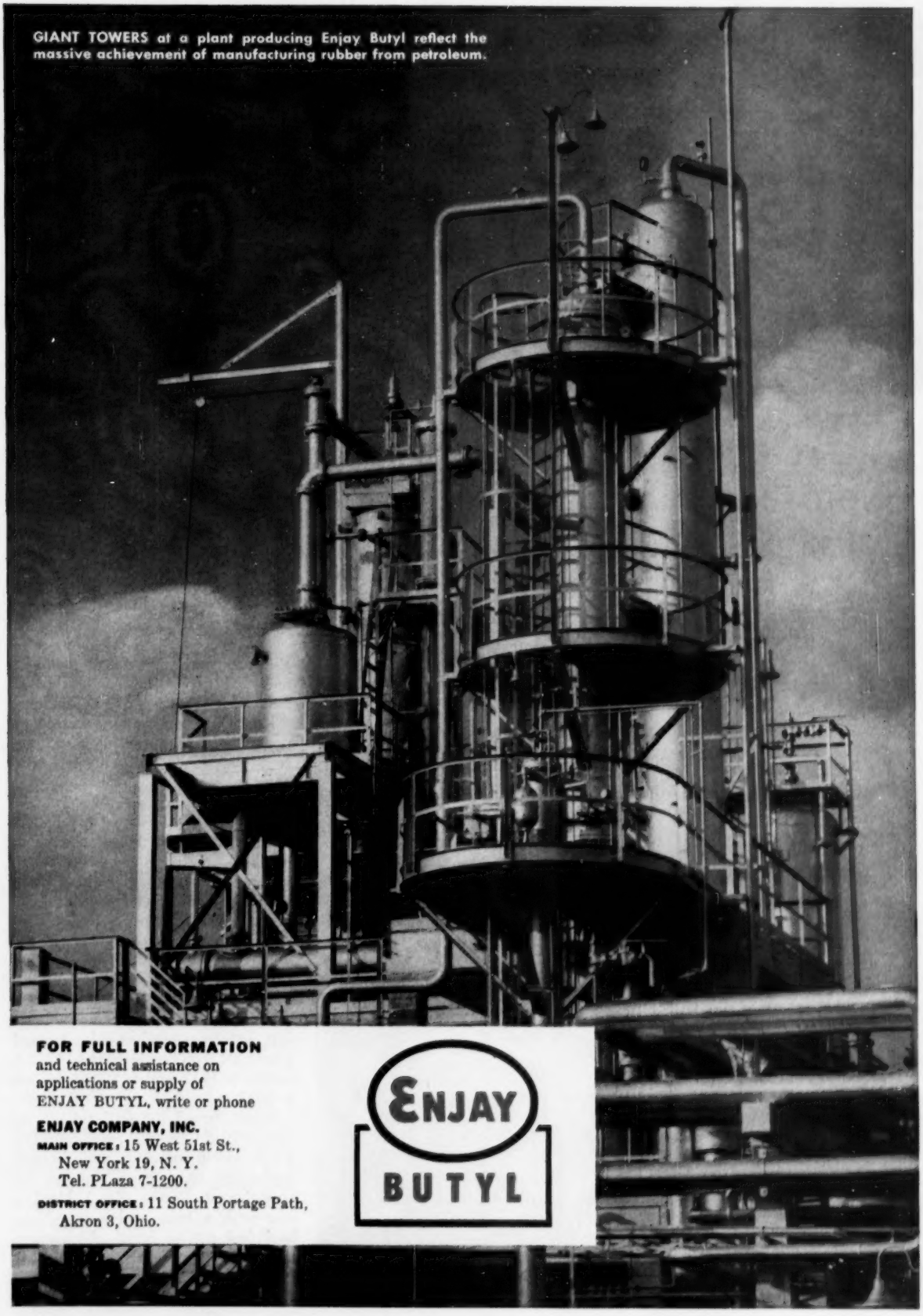
1955 cars use Butyl for dozens of rubber parts, because BUTYL has super-durable resistance to aging or deterioration on exposure to heat, cold, sun, weather, and chemicals.



High voltage electrical cables are made with BUTYL because BUTYL offers superior corona and ozone resistance, combined with excellent heat, cold, and abrasion resistance.

Tractor tires are made with BUTYL because BUTYL gives low tread wear and high resistance to weather, cracking, cutting, and chipping.

Protective clothing, tank linings, belt covers, hoses, and other equipment in contact with chemicals use BUTYL because of its exceptional resistance to chemicals.



GIANT TOWERS at a plant producing Enjay Butyl reflect the massive achievement of manufacturing rubber from petroleum.

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BUTYL

LARGEST SINGLE PLANT: Cooperative Farm Chemicals' $16.3-million nitrogen fertilizer plant at Lawrence, Kan.

Co-ops Go Big Time

Latest USDA estimate: 7,250 farm supply co-ops now operate in the U.S., touch chemical industry in oil, fertilizer and pesticide production.

Largest single chemical producer—Cooperative Farm Chemicals—turns out 83,000 tons of ammonium nitrate, 13,200 tons of anhydrous ammonia, 13,200 tons of nitrogen solutions each year.

Cooperatives are today doing an annual $15-billion total business—and though many have been adversely affected by the decline in farm income, expansion is the order of the day. Most obvious (and most significant) trends: a movement toward amalgamation of smaller cooperatives, and a reorientation of major interest—away from marketing of farmers' produce, and toward purchasing of farmers' supplies.

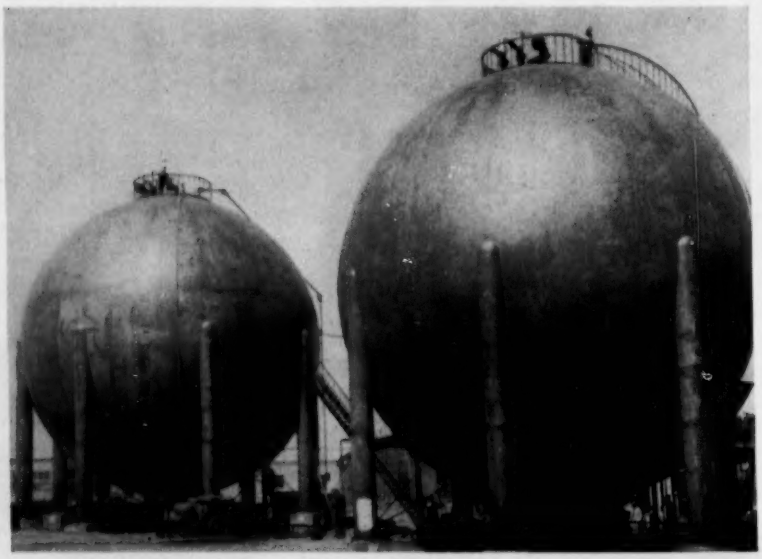
Such trends have more than academic interest to chemical companies—many of which now find themselves in competition with oil, fertilizer, and pesticide-producing co-ops. What's bothering chemical producers most: co-ops now have more than 12 million members—and the number's still growing. In tight market conditions, such a captive buying force could play havoc with chemical company sales.

Growing Experience: In petroleum, co-ops have a 40-year history behind them—and though the percentage of total business production isn't creeping up much now, co-ops in 1952-53 handled $436,275,000 worth of oil products (retail prices).

At a wholesale price level, the rise has been much more spectacular. USDA's continuing study of 25 major regional farm supply co-ops (which includes all the big oil co-ops) shows that petroleum product sales jumped from $204.8 million in 1951 to $220.4 million in 1952, and to $232.8 million in 1953.

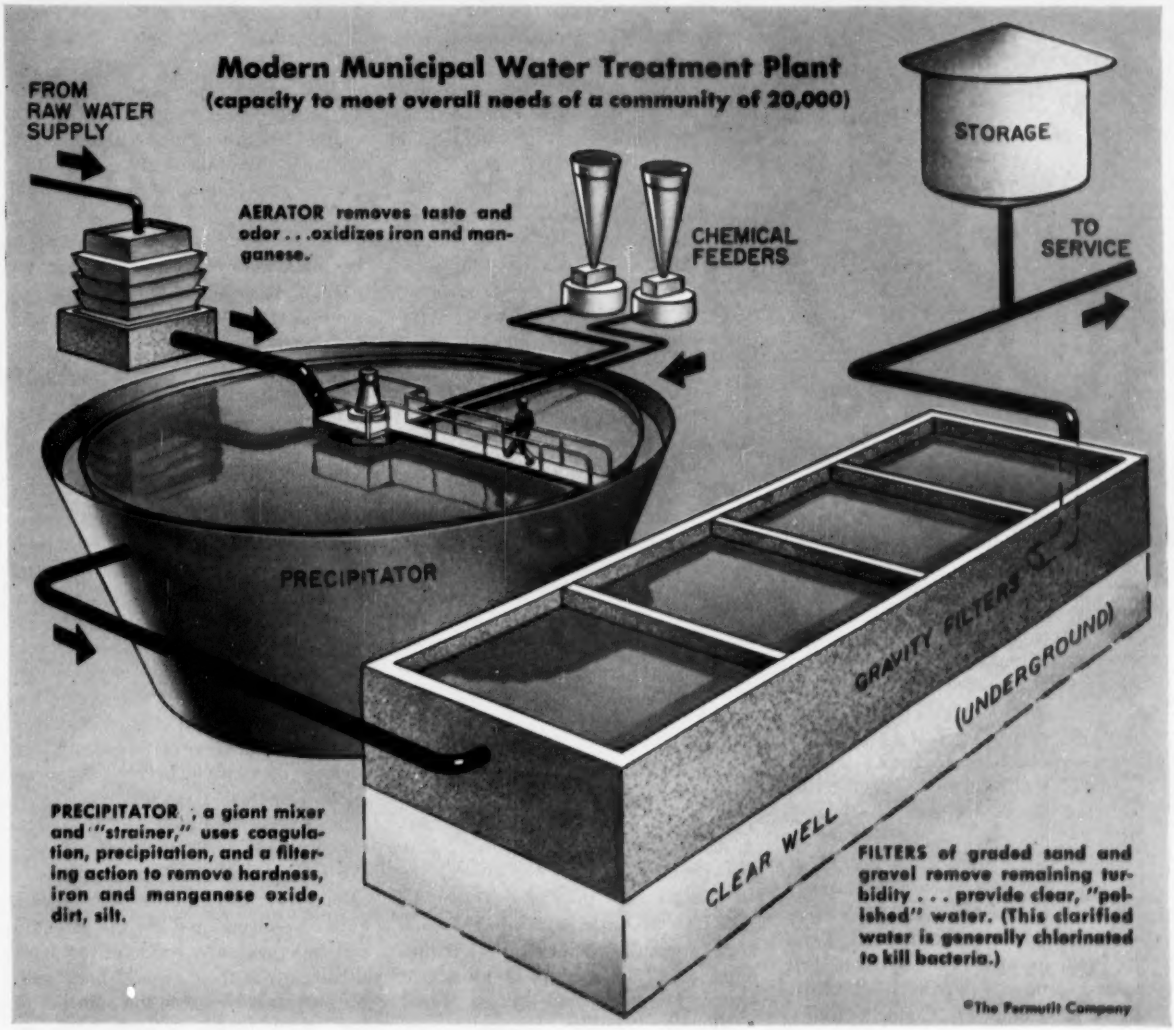
What started the ball rolling: in 1915, World War I was pushing wheat prices upward, and farmers (belonging to a grain elevator cooperative at Kirwin, Kan.) hired a man with a team and a wagon to haul fuel out to farms of members—then switching over to oil-burning tractors.

With the tractor revolution well



AMPLE STORAGE SPACE: Up to 2,000 tons of anhydrous ammonia can be stored at Lawrence.

WATER: Averaging 5¢ a ton "delivered," city water is a bargain . . . but costs may go up as supplies dwindle.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STORAGE
TO SERVICE
PRECIPITATOR
GRAVITY FILTERS
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PRECIPITATOR, a giant mixer and "strainer," uses coagulation, precipitation, and a filtering action to remove hardness, iron and manganese oxide, dirt, silt.
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under way in 1920, farmers around Cottonwood, Minn., and Greeley, Colo., hopped on the bandwagon, organized the first co-ops expressly to handle oil products. Six years later, a group banded together at Minneapolis to found the first co-op petroleum wholesaling venture.

The idea of farmers joining together to serve themselves at cost through their own oil business found ready acceptance among farmers caught in the early depression years. New Year's Day, 1940, the first co-op refinery went onstream at Phillipsburg, Kan.; in 1943, co-ops brought their first refined products pipeline—from McPherson, Kan., to Council Bluffs, Iowa—into being.

Today cooperatives own 1,600 oil wells, 350,000 acres of undeveloped leases, 17 refineries—with a combined crude oil throughput capacity of 153,100 bbls./day. Biggest single oil producer: Consumers' Cooperative Assn. (Kansas City, Mo.), which pumps 2 million bbls. of crude from wells, refines it at four refineries to give 30,000 bbls./day of petroleum products.

Just a Start: Though oil was the first venture the cooperatives made into the chemical process industries, it isn't (by any means) the only product turned out today. In 1951-52, fertilizer sales (to farmers through co-ops) accounted for $183,615,000; by 1952-53, the total had jumped to $216,207,000. This was about 20% of all fertilizer sales in the U.S.

And, following the pattern developed in oil, co-ops are gradually gaining control over the raw materials necessary in fertilizer production. By 1952, they had acquired (or built) 68 plants where nitrogen, phosphorus and potash are combined; by the end of 1954, the number had catapulted to 109.

Three co-ops (Central Farmers Fertilizer Co., National Farmer's Union Service Co., and the Western Fertilizer Assn.) own sizable chunks of the still largely untapped phospate deposits in Utah and Idaho.

Indicative of the interest being paid to further expansion: National Farmer's is proposing a 100,000-ton/year superphosphate output, is also looking over mine sites near Carlsbad, N. M., for a $12-14-million potash mine and refinery.

In Lawrence, Kan. (*see cuts, p. 18*), Cooperative Farm Chemicals has a $15-million, 63,440-ton/year ammonia plant onstream; Mississippi Chemical Corp. (at Yazoo City, Miss.) is upping ammonia production from 70 tons (from a $5-million plant) to 290 tons/day; Illinois Farm Supply Co. (Tuscola, Ill.) has just brought a $1.25-million, 50,000-ton/year ammonium phosphate plant onstream.

In Joplin, Mo., Missouri Farmers Assn. has a $3.5-million ammonium phosphate plant in operation—turning out 70,000 tons/year of fertilizer, 70 tons/day of nitric acid. And Associated Co-op (in Sheffield, Ala.) is running a $2-million, 60,000-ton/year ammonium phosphate unit.

Newest Wrinkle: Pesticides and weed killers are a relatively new venture for co-ops—and actually dropped off in total sales volume last year, from $24,649,000 in 1951-52 to $23,987,000 in 1952-53. Largest single retailer: Co-op Grange League Federation (Ithaca, N. Y.) with $2,838,000 (in wholesale sales) in 1953.

But co-op spokesmen are certain that the fall-off simply represents a market condition brought on by unseasonal weather; this year they predict cooperative pesticide sales will rise again.

No cooperative as yet is known to be manufacturing its own pesticides, though a number of products are made specifically for them under various co-op-owned brands and tradenames. But most of the 25 big regional cooperatives now handle these items—and there has been agitation recently (among the farmers themselves) to get into actual production to cut costs.

Merger—a Probability: Altogether, 12 million U.S. families are now part-owners of cooperatives—and the number can be expected to increase materially in the years ahead. An all-time peak in farmer membership was reached in 1952-53 (most recent figures available); over 3 million farmers belonged to at least one association—duplication of membership in several cooperatives brings total membership up to 7.5 million.

It's this duplication that leads industry observers to predict merger of a number of the smaller co-ops as a virtual certainty in the year ahead. Farmers—encouraged by the strength and independence cooperatives have already given them—would back merger proposals almost to the man. With size, they reason, co-ops have an increasingly good chance of bucking corporate chemical competition.

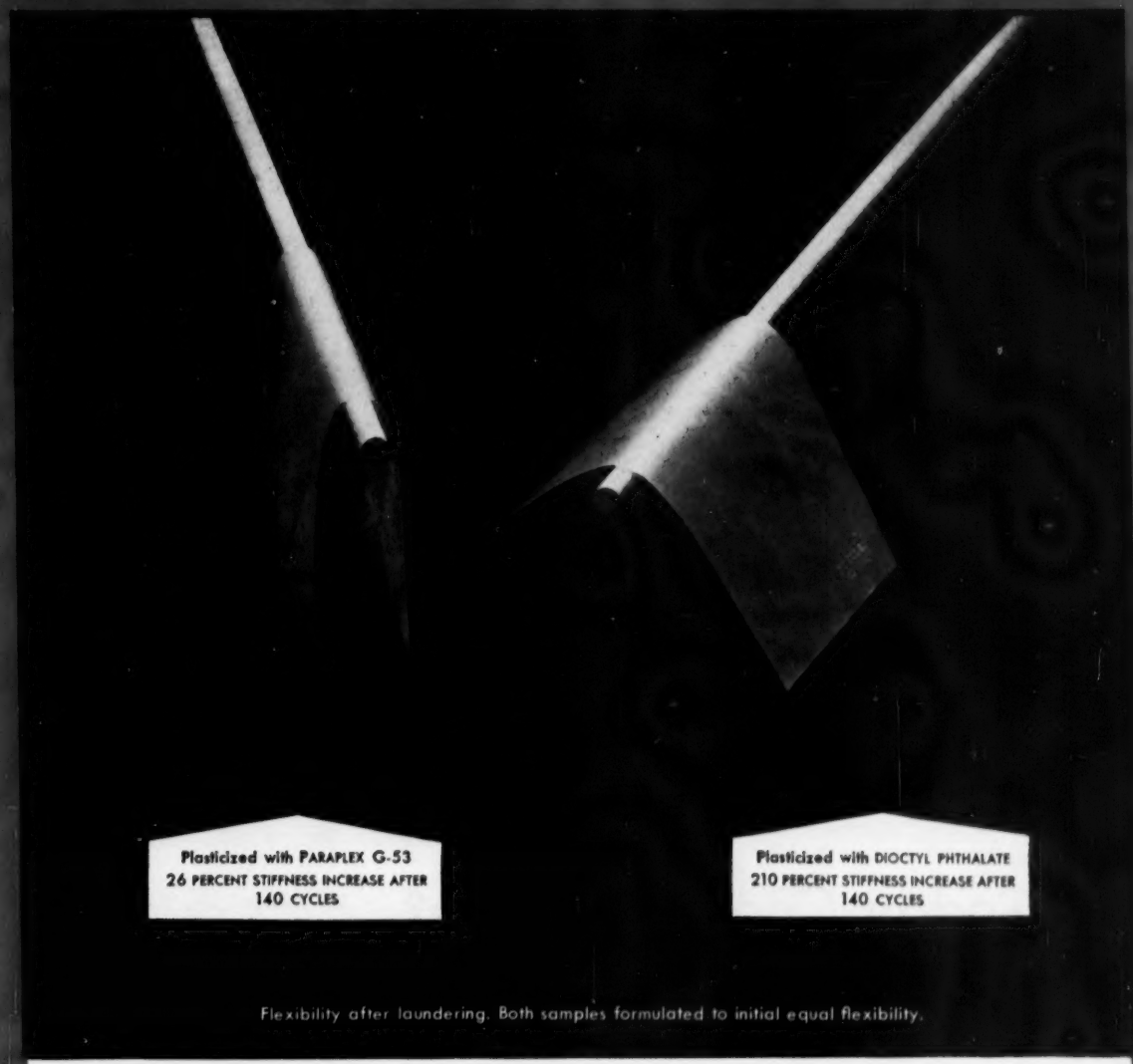
Status at a Glance

TODAY—2,654 retail co-ops handle oil products
3,392 retail co-ops sell fertilizers
1,489 retail co-ops handle pesticides

IN VOLUME OF BUSINESS—supply co-ops are still dominated by feed sales and petroleum refining

BUT . . .

FERTILIZER SALES now account for 20% of all U.S. fertilizer business.



Flexibility after laundering. Both samples formulated to initial equal flexibility.

Watch out for plasticizers that wash out

Washing vinyl products like baby pants or hospital sheeting in hot, soapy water can be pretty tough on the vinyl plasticizer. Tough on an ordinary plasticizer, that is. PARAPLEX G-53 doesn't mind this kind of treatment. For example, samples of vinyl film containing PARAPLEX G-53 and samples containing dioctyl phthalate were laundered repeatedly in an automatic washer together with family wash. The films plasticized with PARAPLEX G-53 remained soft and supple; the others became hard and rigid.

This ability to stay put under actual washing conditions is just one feature of PARAPLEX G-53 polymeric plasticizer. When you add to that the plasticizer's resistance to extraction by aromatic and aliphatic solvents, you've got quite a combination. And what's more—PARAPLEX G-53 rebels against migration into lacquer, polystyrene, rubber, and baked finishes.

Ask for *What You Should Know about* PARAPLEX *and* MONOPLEX *Plasticizers*, a handy summary of properties and uses.

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CIO'S REUTHER; NATIONAL CHAMBER'S JOHNSTON AND BOWDITCH; GOVERNOR HERTER; NAM'S RITER: On guaranteed annual wage, will economic pressures make union demands . . .

Hot Today, Cool Tomorrow?

Almost as inevitably as the near-at-hand summer, say the economic weather forecasters, the guaranteed annual wage—in one form or another—is heading this way.

But summer has its variables: it hits some localities early, others late; it's torrid in some places, mild in others; and sometimes it's over before you know it.

Similarly, GAW appears destined to have a different future in each industry—and a CHEMICAL WEEK survey of representative chemical process plants indicates this week that in the chemical industries, GAW is likely to arrive late, have relatively little impact on personnel management, and disappear almost unnoticed.

Less Seasonality: Where GAW is being pushed most vigorously, of course, is in the auto industry. President Walter Reuther of CIO's United Auto Workers is driving hard for a GAW clause in the new contracts being negotiated this week with General Motors and Ford.

But employment figures (*see table*) make it clear that the problem of seasonal layoffs has entirely different dimensions in the auto and chemical industries—and it's the volume and frequency of layoffs that have enabled Reuther to "sell" his members on the idea of paying triple dues and risking a strike in their GAW campaign.

No Pressure Yet: By way of contrast, there's been no sign that any pressure for GAW is building up among chemical workers. This is acknowledged by chemical union officers, and explained by *CW*'s spot-check of employment levels at selected chemical process plants. In this survey, "100" was taken as the index of employment when a plant operates at capacity.

INDUSTRY CONTRAST

(Variation in employment of production and maintenance workers —from data by U. S. Bureau of Labor Statistics)

	AUTOMOBILES			CHEMICALS AND ALLIED PRODUCTS		
Year	High	Low	Layoff %	High	Low	Layoff %
1949	686,300	582,100	15.2%	519,000	453,000	12.7%
1950	794,800	567,100	28.6%	524,000	479,000	8.6%
1951	793,400	650,400	18.0%	544,000	526,000	3.3%
1952	767,300	520,700	32.2%	538,000	511,000	5.0%
1953	830,700	703,200	15.6%	525,900	500,600	4.8%
1954	676,800	478,100	29.4%	539,500	512,700	5.0%

Eastman raw materials for the pharmaceutical industry

For information about these and other Eastman chemical products, call our nearest sales representative or write to Eastman Chemical Products, Inc., Chemicals Division, Kingsport, Tennessee.

	SOLVENT	INTERMEDIATE	ACETYLATING AGENT	STABILIZER	MISCELLANEOUS
acetaldehyde		■			
acetanilide		■			
acetic acid	■		■		
acetic anhydride			■		dehydrating agent
acetone	■	■			
benzoquinone		■			
ethyl acetate	■				
hydroquinone dimethyl ether				■	ultraviolet inhibitor
isobutyl acetate	■				
isobutyl alcohol	■				
isobutyraldehyde		■			
isopropyl acetate	■				
oxidized cellulose					hemostatic agent and adsorbent
Tenox®				■	antioxidant series

Eastman
CHEMICAL PRODUCTS, INC.
KINGSPORT, TENNESSEE
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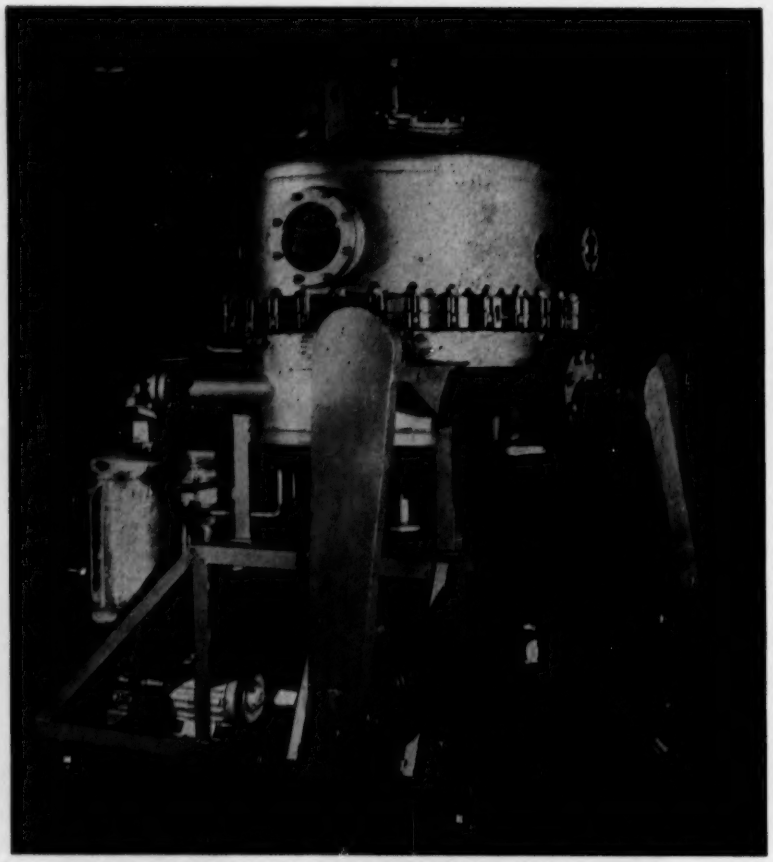
SALES OFFICES: Eastman Chemical Products, Inc., Kingsport, Tenn.; New York—260 Madison Ave.; Framingham, Mass.—65 Concord St.; Cincinnati—Carew Tower; Cleveland—Terminal Tower Bldg.; Chicago—360 N. Michigan Ave.; St. Louis—Continental Bldg.; Houston—412 Main St. **West Coast: Wilson Meyer Co.**; San Francisco—333 Montgomery St.; Los Angeles—4800 District Blvd.; Portland—520 S. W. Sixth Ave.; Salt Lake City—73 S. Main St.; Seattle—821 Second Ave.



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Liquid-solids separation through a pressure-vacuum differential has many applications in chemical processing.

Eimco designed, tested and approved pressure vessels of this type have found wide acceptance in many different kinds of jobs. Some of these use heat and others use inert gas. Some of the jobs involved combustible materials and others non-combustibles.

All of the installations are classified as far as Eimco is concerned to protect the customer's process or his idea and his flow sheet.

Eimco was selected in each case because Eimco's experience in the field of filtration is unsurpassed and Eimco's ability to engineer into each filter that extra quality that provides for greater product recovery and greater profits for the user.

Let Eimco's Research and Development Center tackle your filtration problem. You will have the benefit of work by some of the best technologists in the industry, plus complete pilot plant data. Eimco backs the recommendations of its Research Center by a guaranteed performance.

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B-108

You Can't Beat An Eimco!

B & I. . . . . .

Out of the 17 plant managers who supplied data, more than half of them reported that employment at their plants had held steady at 90 or more throughout the two-year period, calendar years 1953 and 1954. Another plant had steady employment at around 80.

Among the other seven plants, there was considerable variation in plant-force levels; but periods of low employment were relatively short. The plant with the widest spread had 90 or more for 18 months, 70-89 for 4 months, and 50-69 for 2 months. The plant with lowest relative employment for the entire two years had 70-89 for 18 months and 50-69 for the other 6 months. In all, indexes of 90 or more were reported for 285 plant-operation months; 70-89 for 98 months; and 50-69 for 13 months. At none of these 17 plants did employment fall below 50. This bore out the comment of a chemical union vice-president who observed that in the chemical industry "there are layoffs but no closedowns."

Compromise Foreseen: GAW has come to be a broad and inclusive term, and it's likely that any compromise that seems to offer the prospect of steadier work will be acceptable to labor as a starting point. The very fact that management is taking the demand seriously enough to collect statistics for replying to union arguments has given support to predictions that some steps in the direction of GAW will be taken this year.

While some industry spokesmen—such as President Henry Riter III of the National Assn. of Manufacturers—have denounced GAW as a threat to the nation's economy, others have pointed out that management has a big stake in stable employment. As industry puts more money into expensive automatic equipment, it becomes increasingly costly to have shutdowns—and the chemical industry is one of the leaders in mechanization.

Still another factor: the trend toward higher unemployment insurance taxes—such as in the bill advocated by Gov. Christian Herter of Massachusetts; those tax rates vary according to each employer's job stability record.

Both factors argue for the probability that before chemical workers get around to asking for GAW, labor's red-hot demands on this subject today will have cooled off considerably as job stability rises.

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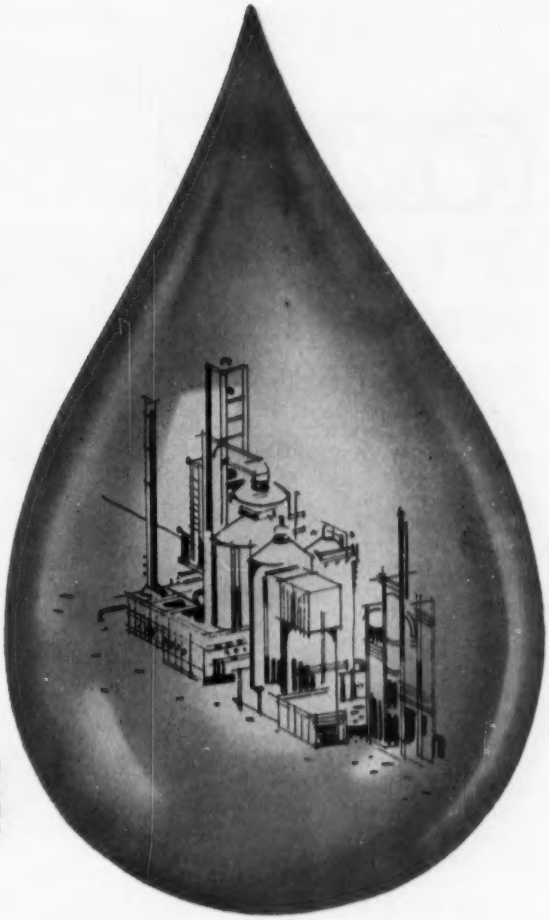
Sinclair



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● **Add or react**—fatty alcohols work both ways. As additives, they emulsify, penetrate, stabilize, solubilize, etc. As intermediates, CACHALOT fatty alcohols are basic in detergents, flotation reagents, lube additives, etc. Esterification, condensation, nitration are only some of their reactive possibilities.

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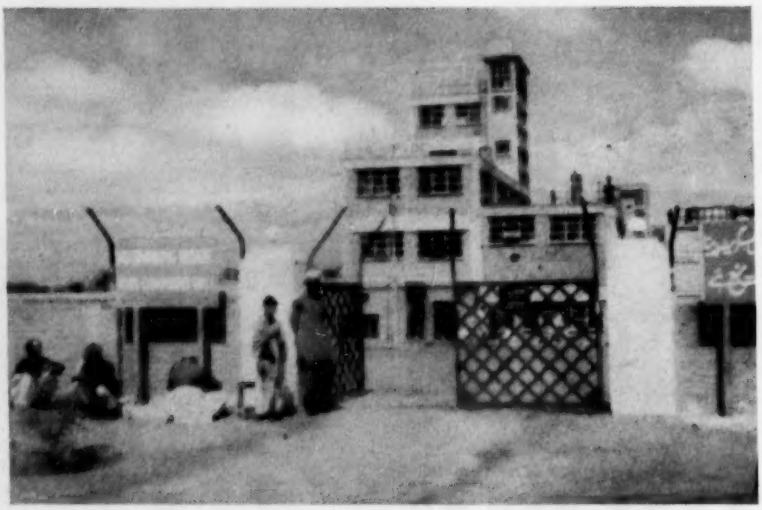

SECOND IN: A UN-sponsored plant at New Delhi, India.

FOREIGN. . . . . .

UN Aid: Thanks to UN-financed plants, there should be some improvement in general health conditions in four countries, this year. Complete DDT plants (using alcohol, chlorine, benzene and sulfuric acid as raw materials) will be in operation in Pakistan, India, Ceylon and Egypt.

Designed by Technical Enterprises, Inc. (New York), the plant at Nowshera, Pakistan, is already in operation (though curtailed by a power shortage), and the New Delhi plant will go onstream next month.

In Egypt, a plant site has been selected in the Nile Delta and construction should be completed this summer; progress in Ceylon pends, awaiting choice of a site for construction of a chlorine plant.

Capacity (at each of the four plants): 700 tons/year of DDT.

•

German-Argentine Enterprise: The Argentine government has given final permission to Farbenfabriken Bayer to build a phenol (and phenol derivatives) plant in Argentina. A new company (Fabrica Argentina de Fenol Y Derivados S. A.) will be formed to undertake the project; 65% of the common stock will be held by two Argentine firms—Bunge & Born, Ltd., S.A. and Compania Quimicia S.A. Total investment: $375,000.

•

Fertilizer/India: The Indian government has granted a license to Parry & Co., Ltd. to build a fertilizer plant at Tadepalli, near Vijayawada. Only stipulation: that construction start within the next six months.

•

Silicones/France: Société Rhone-Poulenc has started commercial production of a complete line of silicones at St. Fons, near Lyon, France. Cost: $10 million.

•

Titanium/Great Britain: Imperial Chemical Industries' titanium plant, now under construction, will be in full operation by mid-July. Output: up to 1,500 tons/year of raw titanium.

•

Synthetic Rubber/France: Ten French firms have banded together to form a new company—Société du Caoutchouc Butyl (SOCABU)—to produce 20,000 tons/year of butyl rubber. Company capitalization: 1,030 million francs.

•

Paper/Thailand: Thai Development Co. will build a 125-million baht ($6.2 million) paper plant in Bangkok to produce 40-50 tons of paper daily. Thailand's daily domestic consumption is estimated at 40 tons—imported chiefly from the U.S.

•

Amonium Sulfate Export/Japan: The Ministry of International Trade and Industry has tentatively set next year's (Aug. '55 to July '56) ammonium sulfate export target at 600,000 metric tons . . . 130,000 tons more than the current fiscal year. Demand abroad, Ministry officials say, has this year already surpassed 470,000 tons.

FAMOUS LIGHTHOUSES OF AMERICA

CAPE HENRY LIGHT, located on the south side of the entrance to Chesapeake Bay, was the first lighthouse to be built by the United States. The octagonal tower of sandstone, 129 feet high, was constructed of materials gathered while Virginia was still a colony. This original structure still stands, though it was damaged during the Civil War and is no longer in use. It was replaced in 1881 by the present lighthouse, a cast iron tower 167 feet high, located 337 feet to the northeast.

Pointing the way to progress in the development and use of electrochemicals is the pioneering research of Niagara Alkali Company. Niagara was the first in the country to produce several of these important materials and through research is constantly improving the usefulness of Nialk® Liquid Chlorine, Nialk Caustic Potash, Nialk Carbonate of Potash, Nialk Caustic Soda, Nialk Paradichlorobenzene, Nialk TRICHLORethylene, Niagathal® (Tetrachloro Phthalic Anhydride).

NIAGARA ALKALI COMPANY

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PECHINEY PRODUCTION: Ranges from new acetone units (at Lavera) to France's largest aluminum plant (at St. Jean-de-Maurienne).

Centennial Fillip

Compagnie de Produits Chimiques et Electro-Metallurgiques Pechiney—France's leading aluminum and heavy chemical producer—is on the move again.

Capitalization will be raised 50% this year; the company is looking toward French North Africa as site of its next big expansion move.

Pechiney—the French industrial giant, which this year is celebrating its hundreth anniversary—is on the verge of a major expansion move—one that will take it into French African Guinea. Company executives (realizing that Pechiney's growth depends in large measure on cheap electric power, unavailable in France*) have been negotiating with the African government for rights to develop the area and casting about for foreign capital to assist in development costs.

Now, however, capitalization arrangements have been completed (the company will expand its capitalization from 9,240 million francs to 13,860 million francs). Result: company officials are privately predicting that, within 6-8 years, its aluminum production in North Africa should exceed 200,000 tons/year—nearly double the current output in France (of which Pechiney now produces a solid 80%).

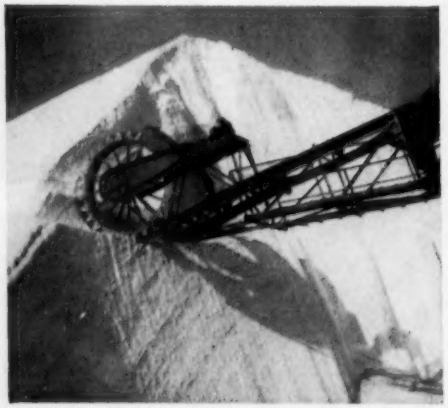
Bow the Chemicals: Despite its intent to increase aluminum production in the immediate future, Pechiney's recent major domestic progress has chiefly been in the basic chemicals. Chlorine output was up 20% last year; trichlorethylene jumped 30%; vinyl chloride increased a neat 50%, and polystyrene soared 90% over 1953 records.

Over-all sales of these products alone rose 25% during 1954—despite slightly lower prices for the year.

Capitalization Up: To take care of its proposed expansion, however, Pechiney is increasing its capital this year by 50% (from 9.2 billion to 13.8 billion francs).

Even then, though, the company is considerably bigger (by U.S. standards) than it looks. It owns (in whole, or in part) 18 other companies in France and overseas territories—which run the gamut of the light metal and chemical industries. Products include: aluminum and magnesium, abrasives, salt and saline products, petrochemicals (especially ethylene and propylene derivatives), plastics and synthetic fibers, pesticides and insecticides, protective chemicals for wood and cellulose products and fertilizers.

* In 1954, Pechiney used 6% of all power generated in France.



SUBSIDIARIES: Turn out a host of basic raw materials.

Only five of these 18 companies are listed on the Paris stock exchange, but their capital almost equals that of Pechiney itself.

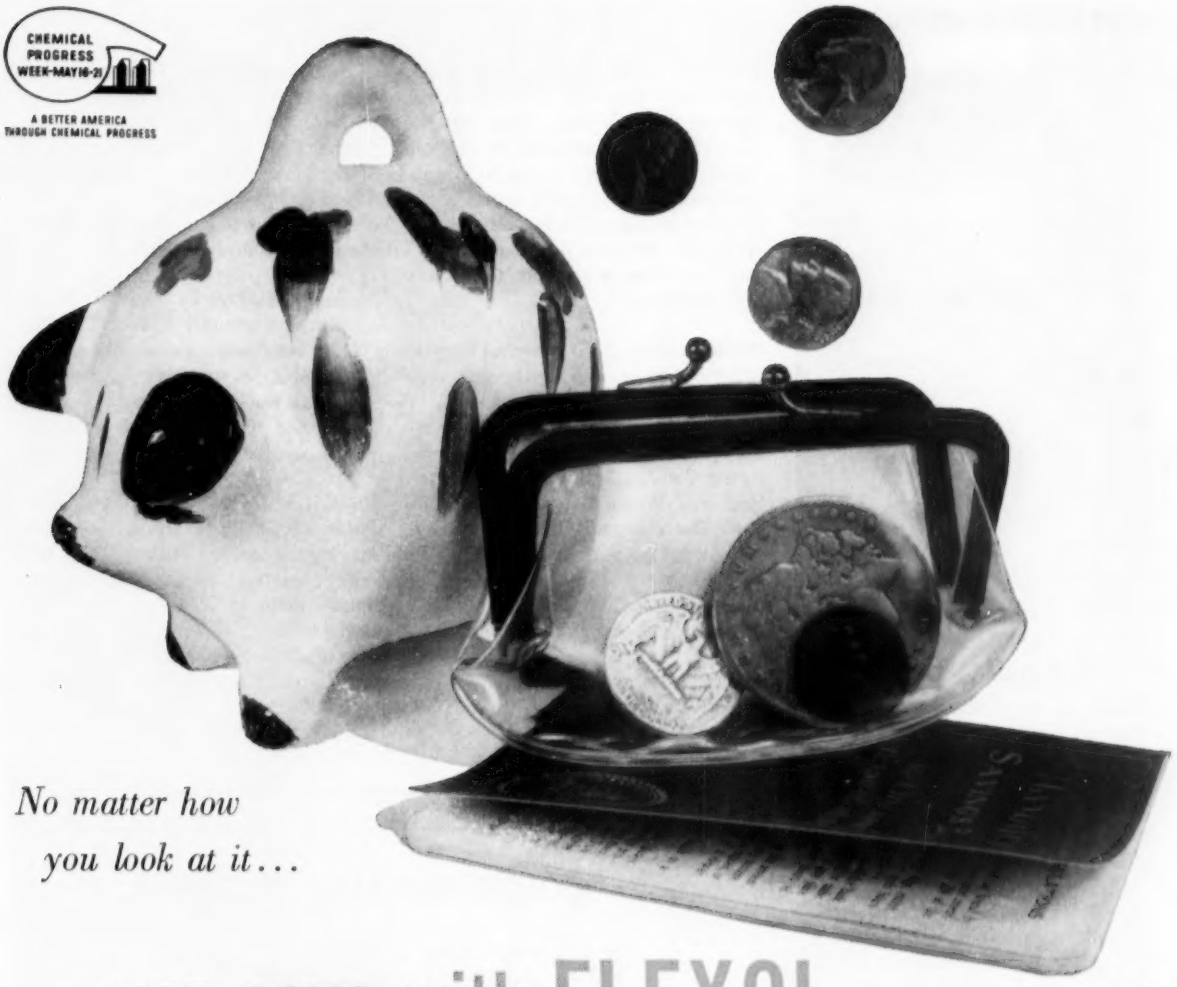
Conscious of Vulnerability: Conscious of its political vulnerability because of its size, Pechiney annually spends considerable money and effort in fending off monopoly charges.

This factor alone was undoubtedly of great weight in the decision to turn to French Africa as the site of future major expansion programs.

But also it is the decision that will bring the company into immediate and direct competition with U.S. producers. Pechiney aluminum can be expected on world markets in quantity by 1960; what products will follow next is a thought-provoking question.

CHEMICAL PROGRESS WEEK-MAY 16-21

A BETTER AMERICA THROUGH CHEMICAL PROGRESS



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WIDE WORLD

GOVERNOR LEADER: In previous administration, a charge of negligence.

LEGAL

Drug Buying Probe: A two-month investigation into practices of purchasing drugs and other hospital supplies for Pennsylvania state institutions has led to a charge of "wilful negligence." Deputy Attorney General John Sullivan has reported to Gov. George Leader that the purchase system in use under the previous administration operated as "an open invitation to graft, manipulation, bribery and extortion, price-rigging and favoritism." The investigation stemmed from a report made just before Leader's administration went into office.

•

Cellophane Appeal: The U.S. Supreme Court won't hear arguments in the government's appeal of the cellophane case during the present term, which ends in June. The high court, faced with the task of drawing up a number of weighty opinions before the summer recess, has announced it will hear no more cases this term. This means that the Du Pont cellophane case and others will be carried over until the court's next term, starting in October. The Justice Dept. seeks reversal of a lower court ruling that cellophane is no monopoly.

•

Gallate Patent: Erich Boehm of Cardiff, Wales, and Theodor Sabalitschka of the U.S. zone of Berlin have brought suit against Heyden Chemical Corp., asking the Federal Court at New York to declare that they are the real owners of a patent (U.S. 2,255,199) that they refer to as the "gallate patent." They allege that the patent had been assigned to Heyden about 14 years ago under a "misunderstanding" that arose because of the inability to communicate due to war conditions. Heyden denies the allegation, is asking the court to dismiss the complaint.

•

Pollution Suits: Two chemical stream-pollution cases are in the news in Michigan and Texas this week.

Mrs. Florence Booth, assistant attorney general of Michigan, is prosecuting the Raisin River case for the Michigan Water Resources Commission. The charge is that the Gerity-Michigan Co., a chrome-plating firm in Adrian, has been discharging chromium and cyanide into the stream, thus poisoning the water supply for the town of Blissfield. She's asking jail terms for the mayor and two other city officials of Adrian plus fines totaling $36,000.

At Houston, Dr. Walter Quebedeaux of the Harris County health unit has filed charges against Marco Chemical Co., asserting that the firm allowed acid wastes and rendering fats to escape into Buffalo Bayou. The company says it has done everything possible to comply with the law.

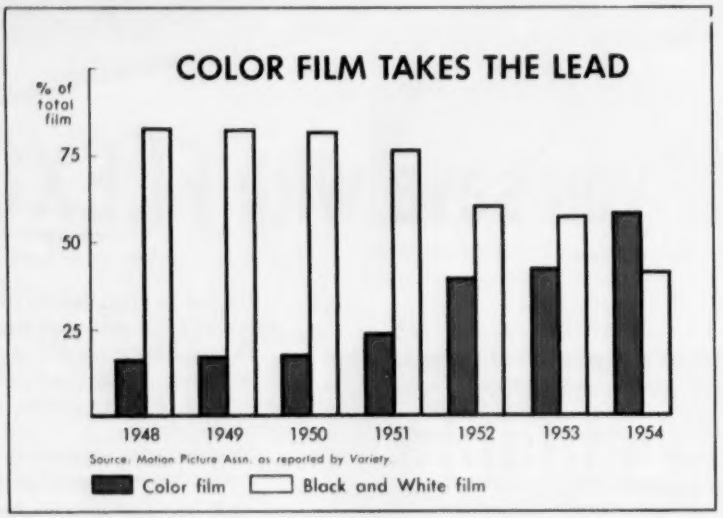
•

Product Liability: In Trenton, N. J., a California minister is asking $100,000 for lung injuries allegedly caused by use of a proprietary nose preparation. Vick Chemical Co. holds that its Va-Tra-Nol wouldn't cause such injury if used according to directions.

•

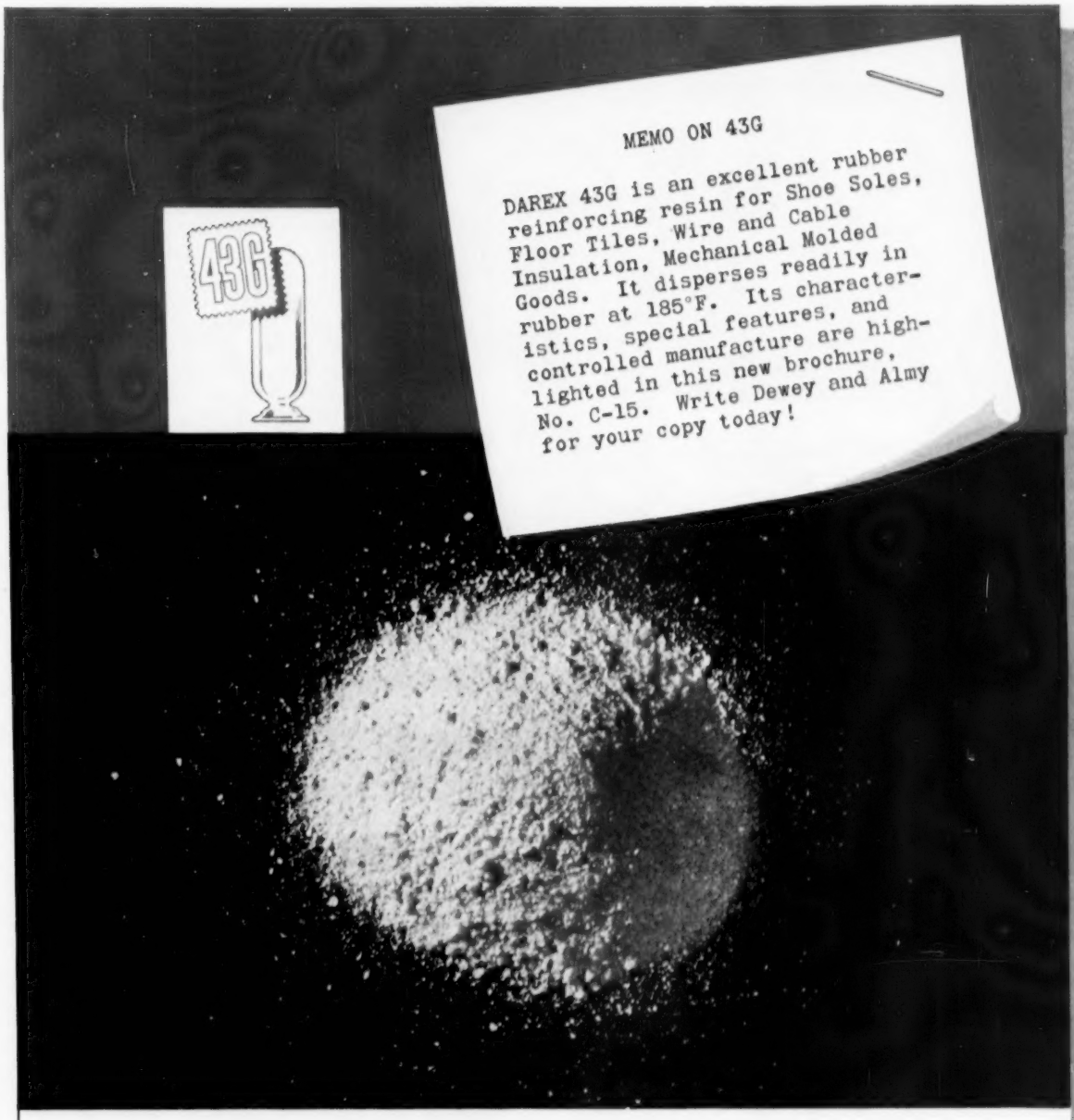
Fluoridation Again: Although fluoridation of public water supplies has been upheld in various states and before the U.S. Supreme Court, anti-fluoridationists in Ohio still aren't convinced. Their case now has been argued before the state supreme court; and if fluoridation is okayed, it probably will be adopted in Cleveland and other Ohio cities and towns.

IMPACT



Movie Magic: More Chemicals

NINE REELS IN COLOR is much more than 1½ hours relaxation to movie-going chemical suppliers. It means profits. Reason: color movies offer expanding, diverse markets for chemicals. In 1954, close to 1 billion ft. of "raw" color film used some 2,080 tons of cellulose triacetate (for emulsion support), 148 tons of silver halides, 590 tons of emulsion gelatin. Consumed in addition: 85 tons of organic dye-couplers and phthlate resins.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WIDE WORLD

AFL'S MEANY: For lower-paid chemical workers, things are looking up.

New North-South Dispute: U.S. Wage

Hinging on how much lobbying power the labor unions can exert in the current Congressional issue of raising the federal minimum wage rate, there may be a slight shift in the chemical industry's competitive economics.

If Congress settles on the 90¢ minimum favored by President Eisenhower and Secretary of Labor James Mitchell, the chemical industry will be virtually unaffected—because chemical wage rates, both North and South, are generally well above that figure.

But if AFL President George Meany and other labor union leaders succeed in persuading most congressmen that the minimum should be at $1 or more, then a number of Southern chemical producers will have to hoist their pay scales; and there'll be that much less competitive edge in taking advantage of lower labor costs in the South.

Chain Effect: What Southern management is concerned about is the over-all effect on wage scales. An increase in the federal minimum wage not only forces up a company's lowest wages; the company just about has to raise wage rates all along the line in order to maintain rate differences.

Currently, lowest rate allowed under Walsh-Healey law in basic chemicals in Southern states is 95¢, right in the middle of the dispute. A $1 federal minimum would have an even more pronounced effect in Southern paint and varnish plants, where the floor has been around 80¢/hour.

Nearly all chemical producers in the North have starting rates at $1 or more. For them, the debate is academic—unless Congress begins to take seriously Meany's contention that there should be an immediate $1.25 minimum wage and, within two years, a 35-hour work week.

New Civil War: This North-South issue is the focal point in the current struggle over raising the minimum wage. Mitchell pointed this up in his testimony before the Senate's Labor subcommittee headed by Sen. Paul Douglas (D., Ill.). He explained the Administration's reasons for seeking a 15¢ increase this way:

A 90¢ minimum would mean an automatic pay rise for 1.3 million workers—500,000 of them in the South. But, he declares, this could be put into effect with "a minimum of dislocation." On the other hand, he figures, any rate from $1 on "might be seriously difficult for the South, particularly, to absorb."

This is the first big labor issue to come before this 84th Congress. The outcome will give a clear indication of union lobbying strength on Capitol Hill.

Transfer of Rights

Sulphur Exploration Co. has acquired sulfur rights to High Island dome in Galveston County, Texas, from Stanolind Oil and Gas Co. Terms of the agreement include: rights to 1,500 acres of land, equal share of the profits from sulfur production after Sulfur Exploration has recovered its expenses (estimated at $1 million) of building the plant.

Stanolind has already drilled 37 wells, several of which are reported to have shown good quantities of commercial sulfur, but Sulphur Exploration will drill seven more wells to determine the extent of sulfur structures on the dome.

Plant construction will start sometime this summer; plans now call for a Frasch-type operation with a 500-tons/day capacity.

Sulphur Exploration also owns an interest in Isthmus Sulphur, a company that owns more than 30,000 acres of sulfur concessions on the Isthmus of Tehuantepec. Too, it owns a 20% interest in Humble Sulphur—which will mine deposits on Humble Dome, in Harris County, Texas.

Add Two Mergers

Two more mergers were officially revealed last week—both of which had been anticipated by industry observers (*CW Newsletter, April 23*):

- Carlisle Chemical Works, Inc. (Reading, O.), has acquired Advance Solvents & Chemical Corp,, manufacturer of driers (for the paint and printing industries), stabilizers and plasticizers (used in the rubber and plastics industries) and other specialty compounds. Beside extending its operations in the chemical additive field, Carlisle further gains a Canadian subsidiary (Advance Solvents & Chemical Corp. of Canada) and an export business (through Advance International, Ltd.).
- Terms under which Olin Mathieson Chemical Corp. will take over Blockson Chemical Co. have been decided. For every share of Blockson, shareholders will receive three-quarters of a share of Olin Mathieson. All arrangements are still tentative, pending stockholder agreement.

Olin Mathieson sales for the first quarter are up 10% over 1954; Blockson sales are about the same as '54's.

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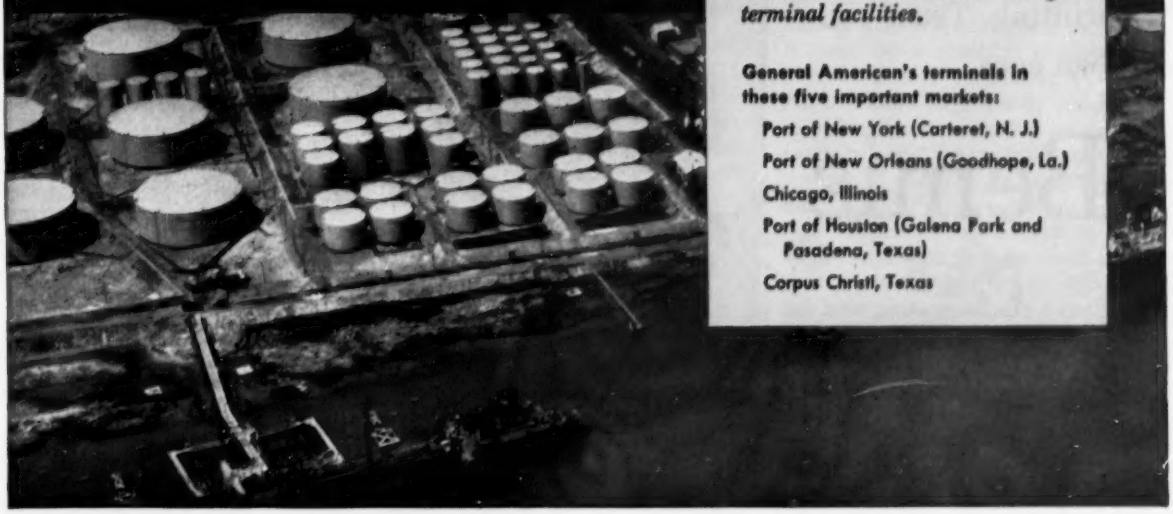
- Port of New Orleans (Goodhope, La.)
- Chicago, Illinois
- Port of Houston (Galena Park and Pasadena, Texas)
- Corpus Christi, Texas



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CLEARY, HELMER: In bargaining conference, a chemical point of view.

LABOR. . . . . .

Danger Spots: These days, major upheavals are in the offing in U.S. industrial relations: AFL and CIO are trying to arrange a joint convention this fall to put their merger into effect; a battle is under way over a 90¢ or $1.25 federal minimum wage; and the big unions are waxing militant about the desirability of a planned program to maintain high employment in the face of the accelerating trend toward use of labor-saving machinery.

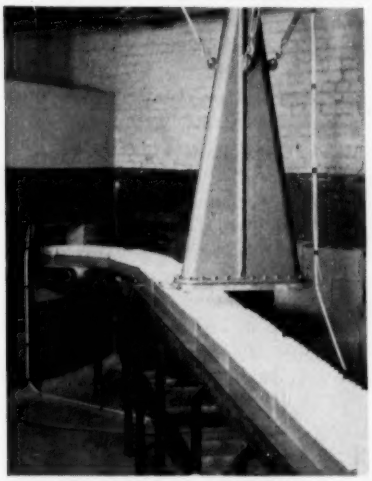
That's the environment in which labor contracts are to be negotiated over coming months, and that's the backdrop for the special conference on collective bargaining to be held May 16-17 in New York. One part of the speaking program will deal with "Danger Spots in Labor Relations," and presenting the chemical industry point of view in that session will be Maurice Cleary, director of industrial relations for Interchemical Corp., and L. L. Helmer, director of industrial relations for Celanese Corp.

Advances in Applied Radiation

DEVELOPMENTS in the FIELD OF APPLIED RADIATION ENERGY, its APPLICATIONS and the APPARATUS USED TO PRODUCE IT

Van de Graaff Accelerator Sterilizes Plastic Containers —

The first high voltage electron accelerator for use in the commercial sterilization of plastic containers has been installed and is now operating at Maynard, Mass., plant of the Bradley Container Corporation.

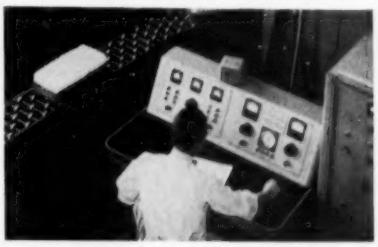


The machine, a 2-million-volt Van de Graaff accelerator built by HIGH VOLTAGE, generates a powerful beam of electrons capable of killing all bacteria within the polyethylene tubes and squeeze bottles being produced by the Bradley concern. Because there is virtually no heat involved in electron sterilization, the plastic material is not damaged by the process. The sterile containers are packed in sealed bags and sent to the user who fills them under aseptic conditions.

The unit also can sterilize small filled packages, such as tubes containing pharmaceuticals.

A patented extrusion-fabrication process developed in Europe is used by Bradley in the manufacture of its containers. Production is now topping half a million units a week, a figure which the company expects to quadruple before the end of the year. Electron sterilization, of course, is required for only a small proportion of this output at present, but demand for sterile packages, both unsealed and filled, is growing as new applications are developed.

Bradley Container's Van de Graaff is similar to the 2-million-volt electron machine installed in HIGH VOLTAGE's own radiation facility at its plant in Cambridge, Mass. The facility is completely equipped with radiation room, conveyor system, control room and product preparation room. This facility is available to industry on an hourly rental basis and has already been used by more than 80 companies for their exploratory work in electron sterilization, polymerization, cross-linking and other radiation processing applications.



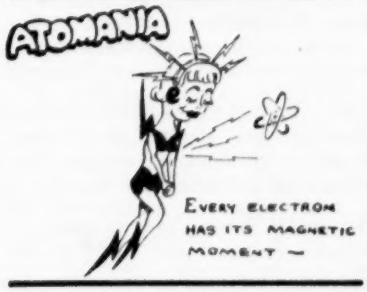
The accelerator at the Bradley plant is the first high voltage electron beam sterilizer to be used in commercial packaging – an industry in which the Van de Graaff accelerator is expected to find wide future application.

Radiation-Sterilized Plastic Tubing Introduced —

The first electron-sterilized plastic tubing available commercially was offered for sale last month by the Clay-Adams Company, Inc., New York manufacturer of medical and surgical equipment and supplies. The new product is marketed under the Clay-Adams registered tradename of "Intramedic" Polyethylene Tubing. Available in convenient lengths, the tubing is packaged in sterile sealed plastic envelopes. The whole package is irradiated in one operation by passing it through a beam of electrons emitted by HIGH VOLTAGE's 2-million-electron-volt Van de Graaff accelerator. Complete sterility within the envelope is achieved within a few seconds. HIGH VOLTAGE performed the experimental testing irradiations for Clay-Adams in its 2-million-volt radiation facility at its plant in Cambridge. The sterile tubing is available in diameters of from .038″ to .075″. It is expected to be used primarily for the administration of caudal and spinal anesthesia and for the intravenous injection of blood plasma and other fluids.

The irradiation of this plastic tubing by HIGH VOLTAGE further establishes that complete sterilization can be accomplished economically using a Van de Graaff as a radiation source.

Radiation processing also is being utilized by the chemical and petroleum industries. For example, the use of electrons for the cross-linking and polymerization of plastics and other chemical products is a growing field. At HIGH VOLTAGE's Cambridge plant, products to be irradiated are loaded on a conveyor belt and are carried under the scanner of the Van de Graaff, permitting a continuous production-line type of operation. As a result, HIGH VOLTAGE can process small production lots at rates up to 400 lbs. per hour per megarep on a continuous basis. Details will be supplied upon request.



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triethyl orthoformate

$HC(OC_2H_5)_3$

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specific gravity	● .892 – .896 at 20°/20° C.
color	● Maximum 15 Hazen Scale

Typical reactions of TRIETHYL ORTHOFORMATE

$HC(OC_2H_5)_3 + ROH \rightarrow HC(OR)_3 + 3C_2H_5OH$
Alcohol — Trialkyl (Aralkyl) Orthoformate

$HC(OC_2H_5)_3 + RR'C=O \rightarrow RR'C(OC_2H_5)_2 + HCOOC_2H_5$
Carbonyl Compound — Acetal or Ketal

$HC(OC_2H_5)_3 + CH_2(CN)_2 \rightarrow C_2H_5OCH=C(CN)_2 + 2C_2H_5OH$
Malononitrile — Ethoxymethylene Malononitrile

$HC(OC_2H_5)_3 + CH_3CBrHCOOR + H_2 \rightarrow (C_2H_5O)_2CHCH(CH_3)COOR + C_2H_5OH + HBr$
Alpha-Brom-Propionic Ester — Acetal of Formyl-Propionic Ester

$HC(OC_2H_5)_3 + C_6H_5COCH_3 \rightarrow C_6H_5COC_3H_7 + HCOOC_2H_5 + C_2H_5OH$
Acetophenone — Phenyl Propyl Ketone

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Erratic Picture: As to current wage practices, the geographic picture is on the erratic side this week. More than 25,000 textile workers in New England went on strike in an attempt to keep their 24 employers from cutting present wage rates, which management says are 23¢/hour higher than in competing mills in the South. But Texas chemical plants, it seems, don't fit into the South's low-wage tradition: about 170 maintenance electricians have gone on strike at Dow Chemical's A and B plants at Freeport, demanding a 15¢ wage increase instead of the 10¢ rise offered by the company. This strike has idled most of the plants' 5,700 employees, has also halted construction of three new units for production of soda ash, polyethylene and synthetic glycerine.

But while a 10¢ boost was being rejected by workers on the Texas Gulf Coast, a 3¢ increase was being accepted by chemical workers far to the north. This was in Niagara Falls, Ont., in a new one-year contract between North American Cyanamid and United Electrical Workers (Ind).

KEY CHANGES. . .

Sam S. Emison, to vice-president, sales, and **Charles M. Hickey,** vice-president, manufacturing, Consolidated Chemical Industries, Inc. (Houston).

Edward W. Sloan, Jr., to director, Cowles Chemical Co. (Cleveland).

Benjamin S. Collins, to chief development engineer, Plastics Division, Nopco Chemical Co. (Harrison, N. J.).

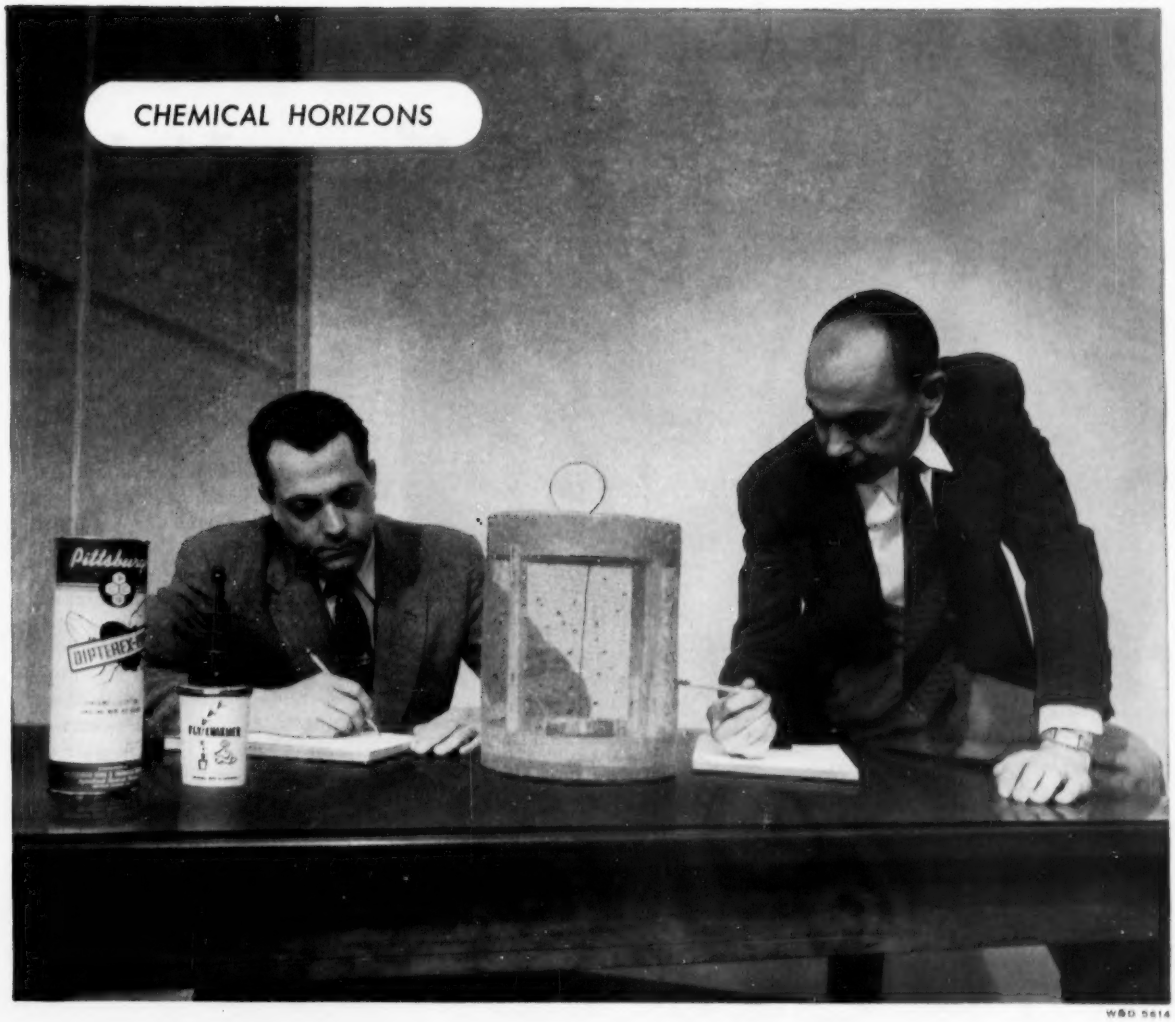
S. A. Swensrud, to board chairman, **P. W. Cornell,** to vice-president, and **J. E. Miller,** to general sales manager, Goodrich-Gulf Chemicals, Inc. (Pittsburgh).

Lucius D. Clay, and **Arthur E. Pettit,** to directors, General Aniline & Film Corp. (New York).

Lars E. Ekholm, to manager, sales division, Climax Molybdenum Co. (New York).

James W. Maples, to director, manufacturing, and **Herbert H. Wiedenmann,** to production manager, Firestone Tire & Rubber Co. (Akron).

Thomas F. Cleary, to sales manager, organic intermediates, Philip J. Lo Bue Co. (New York).



WBD 5614

They're Plotting the Perfect Murder

THESE two Pittsburgh scientists are plotting mass mayhem on a killer who has carried more death to humans than all beasts of prey and poisonous reptiles combined. His name is *Musca Domestica*, the common house fly.

Of all the earth's 600,000 species of insects, perhaps none has resisted obliteration more successfully than the house fly. He has developed a smug immunity to almost every modern insecticide science can concoct.

As a leading producer of coal-derived insecticides and other agricultural chemicals, Pittsburgh Coke & Chemical last year assigned a special team of entomologists and chemists to "Operation Musca." Reasoning that it's easier to bring the fly to the insecticide than the insecticide to the fly, the research group set about to explore the habits, likes and dislikes of the house fly.

They discovered, for example, that the most attractive colors to him seem to be the darker shades, that he prefers to alight on horizontal rather than vertical surfaces, and that humidity and temperature have a marked effect on his appetite.

On the basis of this study and extensive chemical research, Pittsburgh recently began marketing two new lure-type fly killers which may prove revolutionary in their effectiveness.

One, called *Dipterex-199*, is a granular bait for use principally on farms. The other, called *Fly-Charmer*, was developed for fly control in the home without sprays or traps. Tests indicate an encouraging inability of flies to build an immunity to the new, fast-killing, odorless insecticide in both products.

Developing more efficient insecticides is one more way Pittsburgh Coke & Chemical provides you with better products . . . *through research.*

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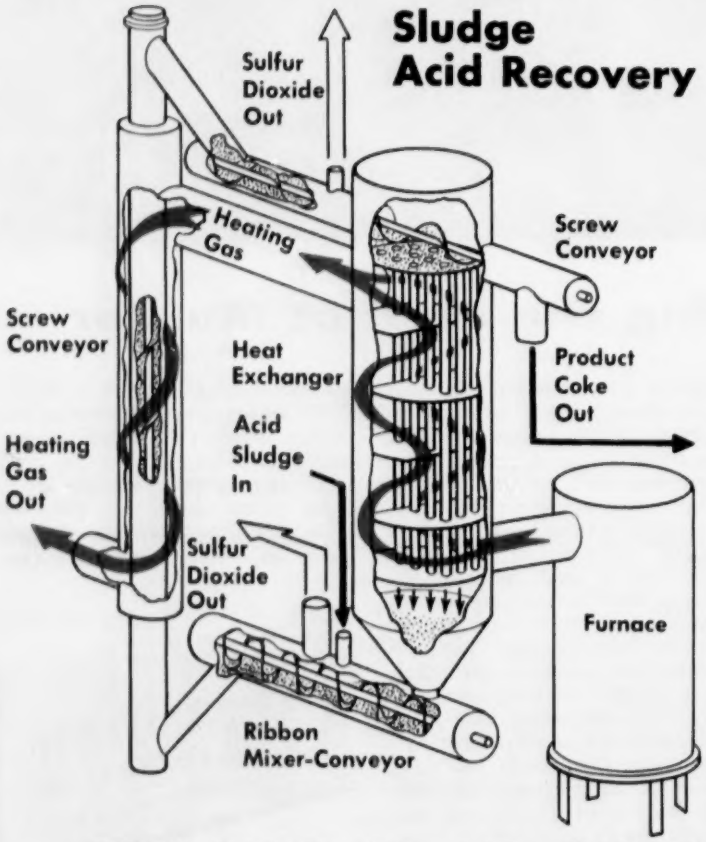
Sludge Acid Unit Turns Liability

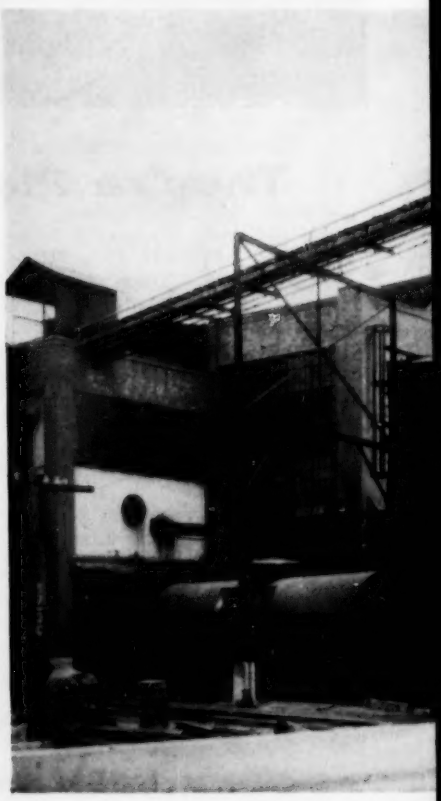


Simpler equipment requirements; more efficient acid recovery; lower installation, operating and maintenance costs. These are some of the impressive claims made by L. Sonneborn Sons, Inc. (New York) for its new sludge acid recovery process.

And when you consider that these improvements were made possible by turning troublesome by-product coke into a salable material, it's not surprising to note that three new installations are already scheduled for operation in the near future.

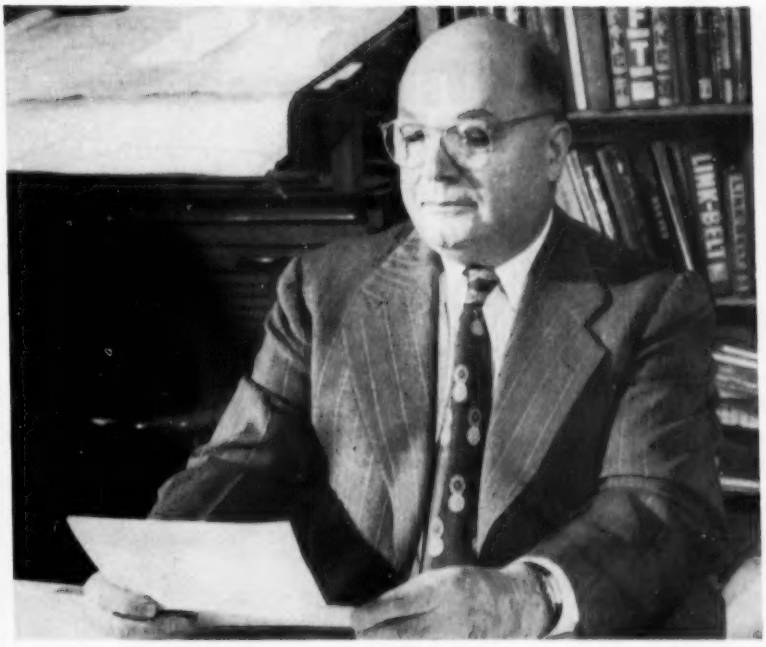
With the experimental equipment now in regular production at its Daugherty Refinery (Petrolia, Pa.), Sonneborn is readying its second unit for operation by June 1, plans to erect a third soon after. And next week, Stauffer Chemical Co. will start constructing the first licensed installation, due onstream in mid-July at Hammond, Ind.

The new process is the brain child



PETROLIA PLANT: From 45 tons of sludge acid daily, acid plant (above) gets concentrated sulfur dioxide for 18 tons of sulfuric, while 10 tons of coke flows to car-loading storage hopper (right).

to Asset

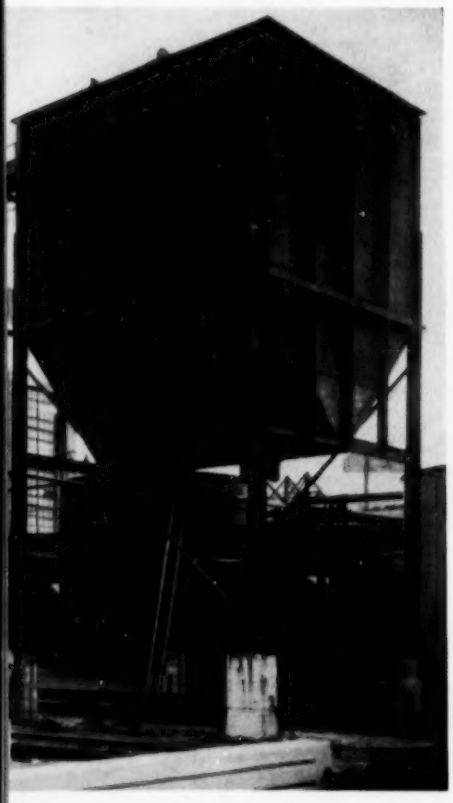


SONNEBORN'S MILEY casts nuisance coke in helper's role.

of Sonneborn's acid plant superintendent G. Hunter Miley. An acid plant specialist all his industrial life, Miley supervised construction of the first sludge acid decomposition recovery plant at Petrolia in 1932, and since then has devoted much of his time and practical know-how to the development of the process that bears his name.

Coke Recycle: Though it involves the same basic reactions used by other sludge acid recovery methods, the Miley process employs unique equipment and operating cycle. Key: the high recycle of coke (about 20 volumes of coke/volume of sludge acid) carrying the heat required to decompose the sludge in the absence of air. Thinly spread over a large exposed surface, the sludge decomposes faster and more thoroughly at lower temperatures. This is how it works:

Sludge acid and hot coke enter a decomposition zone where they are blended together by a ribbon mixer-conveyor (*see drawing*). Heat from the coke reduces most of the sulfur in the acid to sulfur dioxide before the sludge-coke mixture is discharged.



The coke flows from the mixer into the foot of a vertical screw conveyor, is raised through a countercurrent flow of hot gas, which helps to complete decomposition.

From the top of the vertical screw, the coke is moved (by a horizontal screw) to the top of a shell-and-tube heat exchanger. A small portion is discharged to storage while the bulk passes downward through exchanger tubes to be heated.

As the coke drops out of the tubes, it's brought into contact with hot gas from the furnace to burn off any remaining hydrocarbons. It then passes back into the mixing section to complete the cycle.

Wide Range: The basic equipment unit is designed to handle about 45 tons/day of sludge acid, costs less than $50,000 to build. Though older processes couldn't handle low acid-content sludges, the Miley process is said to be efficient over a wide range of acid concentrations. Optimum feed is in the range from 50-60%, but values can be recovered from sludge containing as little as 30% or as much as 75%. Efficiency, however, falls off at these extremes. And such sludges are usually blended with others to bring the total acid content closer to the recommended range. The only condition that must be met, says Sonneborn, is that the sludge be both "pumpable and cokable."

Sludge treated at Petrolia is 50-60% acid from the treatment of white mineral oil. The new Stauffer plant will treat a 55% acid sludge (from a Standard Oil of Indiana refinery), will supply product sulfur dioxide for blending with that obtained by burning 85% acid alkylation sludge in existing facilities.

Pure Products: Chief advantage of the Miley process over direct firing methods, says Sonneborn, is high concentration of product sulfur dioxide. With no air and only small amounts of hydrocarbon combustion products to contend with, gas purification and acid conversion plants can be held to minimum size.

Coke quality, too, is substantially better as a result of the increased recovery efficiency. Coke from earlier processes often contained up to 20% residual acid, was worth only $4-5/ton as boiler fuel. But Miley process coke,

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107A

containing less than 1% acid, is worth more as a source of active carbon than as fuel, has been used for the production of carbon disulfide.

With a Difference: Monsanto Chemical Co. (St. Louis) has a sludge acid decomposition process that also uses sludge in admixture with coke to step up efficiency. But that's where the similarity ends.

Taking a slightly different tack, Monsanto has tailored its process to handle sludge acids containing upwards of 80% free acid. Lower acid-content sludges can be treated without changing equipment, but below 60% free acid, additional purification steps may be required to remove condensable hydrocarbons from product sulfur dioxide. Also, the upper limit of acid concentration should not be very much above 80% if capacity is to be maintained at optimum efficiency.

The treatment of high acid-content sludges necessitates several other differences in the processing cycle. For one thing, coke and sludge must be mixed together before they enter the heating zone, since hot blending leads to the formation of large masses of "sponge" coke. Coke from the decomposer is returned to a paddle-type mixer, sprayed with sludge acid to be decomposed.

The Monsanto process allows some flexibility in choice of equipment, can use as the decomposer any type of furnace that permits indirect heating of granular material. A muffled, mechanically rabbled furnace of the Herreschoff type, with one or more hearths, is generally preferred, since it offers relatively high unit capacity.

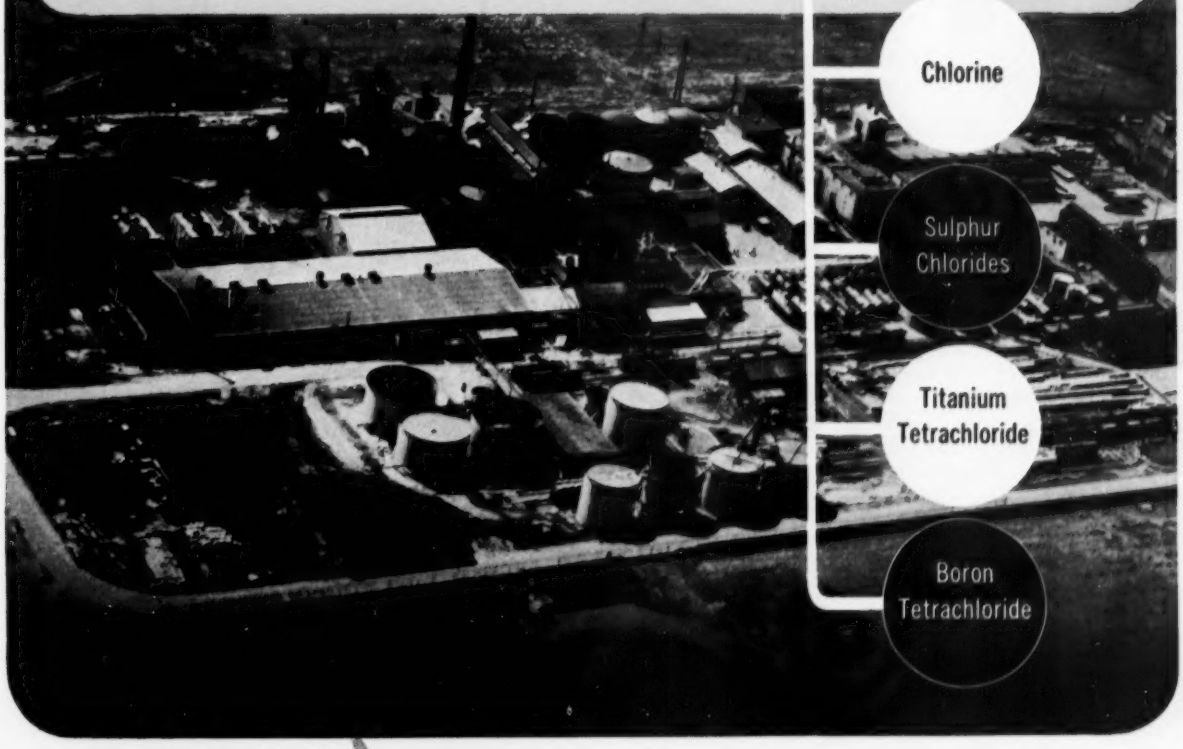
Quality of by-product coke is about the same as that produced by the Miley process. Product sulfur dioxide is recovered in high concentrations (70-90%), but may contain more hydrocarbon combustion products, depending on the composition of the feed.

A modification of Chemical Construction Co.'s (New York) Heckenbleikner process (the original decomposition method) also uses recycled coke as an efficiency-boosting heat carrier. Though most of Chemico's recent work in sludge acid regeneration has been in sludge burning plants (four 400-ton/day sulfuric plants for Consolidated Chemical), it still offers rotary kiln process to handle coke-producing, low-acid wastes.

A LITTLE CHEMICAL DIVERSIFICATION GOES A LONG WAY

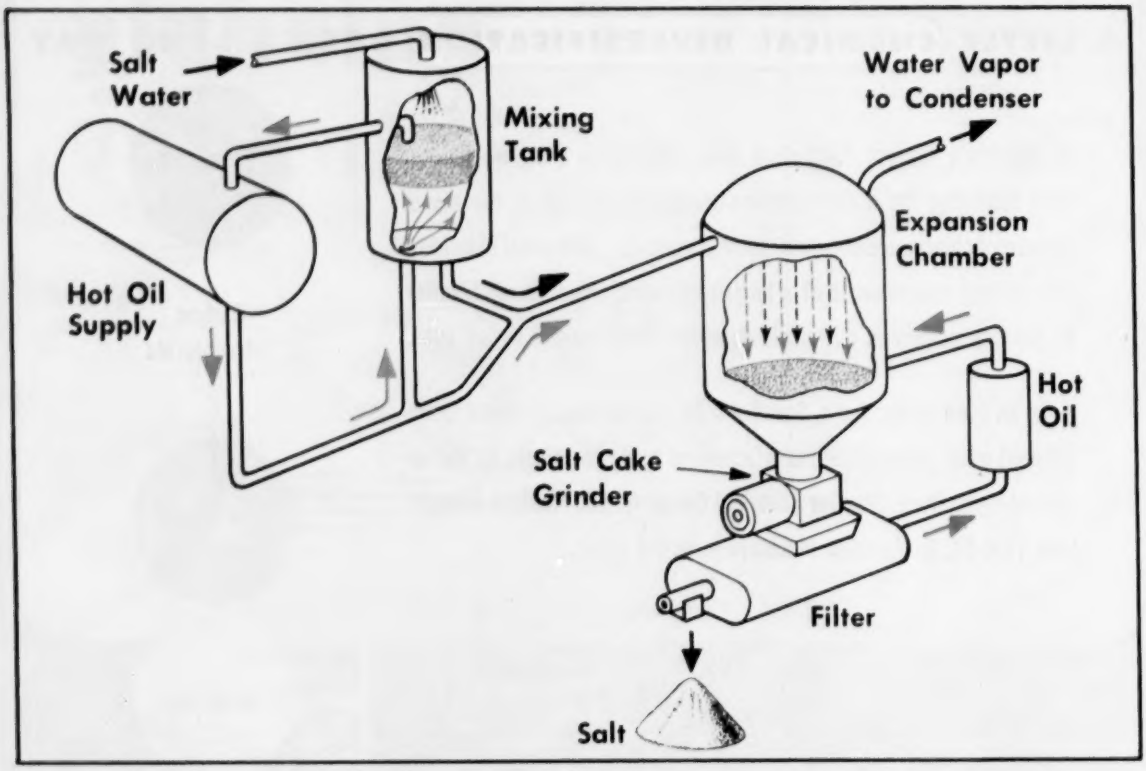
At Stauffer's Niagara Falls plant diversification is a big word — for here following the initial Chlorine-Caustic production is the manufacture of chlorinated solvents, sulphur chlorides, and metal chlorides. This is only one example of a large integrated operation at Stauffer to produce numerous chemicals destined for many and varied uses.

On an even larger scale, Stauffer's 38 plants, coast-to-coast, complement each other in the manufacture of basic chemicals for industry and agriculture. **Stauffer Chemical Company, 380 Madison Avenue, New York 17, N. Y.; sales offices in principal cities.**



38 Plants to serve you . . . . . Coast-to-Coast

STAUFFER CHEMICALS



Can Oil Beat Corrosion?

Overlooking no bets that show promise of slaking industry's ever-growing thirst, several equipment manufacturers and major engineering firms are this week looking over a new method of getting fresh water from the sea. Proposed in a patent application by Henry L. Woudhuysen, president of Woudhuysen & Associates (New York), the process involves the use of hot oil to heat sea water by direct contact, carry away the salt.

The novel scheme marks Woudhuysen's debut as an inventor. A specialist in organo-metallic fungicides, he was never much concerned with water purification or immiscible liquid systems until he hit upon the germ of the idea one day while commuting to his plant in Long Branch, N. J.

As he sees it, fresh water production requires a large capital investment for a plant to turn out tremendous volumes of a product which has practically no value. Add to that the high replacement cost of short-lived equipment and you have an exceedingly unattractive economic picture.

Longer-Lived: In order for a large (say, 1 million gal./day) plant to be economically feasible, it would have to have a useful life of at least 50 years. The necessary longevity could only be achieved, Woudhuysen feels, by reducing the corrosive action of salt water, preventing injurious, hard-to-remove scale buildup. And that's what he hopes to accomplish by using oil as a heat-transfer medium.

Still in its embryo stage, the proposed process has far to go before equipment design or pilot operation can get under way. But the patent application suggests several plans for utilizing the basic principle.

In the simplest operation (*see drawing*), cold sea water would be heated by recirculated hot oil (120-150 C) until it reached a temperature of just over 100 C at slight positive pressure (about 10 psi.). Automatically operated valves would then discharge the hot salt water into a mixing line through which it would flow, with more hot oil, to an expansion chamber at atmospheric pressure. Water, vaporized by the slight amount of superheat at the lower pressure, would be drawn off to condensers; salts would drop out with oil, later be removed by filtration.

Woudhuysen visualizes large-capacity plants using batteries of these or similar multi-stage units to get desired throughput. Though five to ten volumes of oil per volume of water must be used, the quantity required would be small relative to amount of water produced.

Possible Bugs: Every new idea has its possible snags, and this one is no exception. Some of the questions that must be answered before it can be considered technically feasible:

- How pure will condensed fresh water be? There's a possibility of some salt carryover, and cracked oil components could add taste, odor.
- How economical will it be to operate? The fairly high rate of oil recirculation will take power for pumping. And, of course, it will take just as much heat input to evaporate by this method as it does by any other.
- Will presence of oil in the system effectively limit corrosion enough to increase the equipment's life span? Much of the system, including automatic controls, will still be exposed to direct contact with salt water. And

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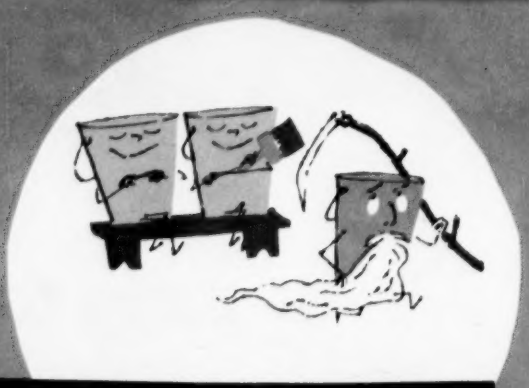
MONOCALCIUM PHOSPHATE, ANHYDROUS-V-90®—Typical Uses: Manufacture of self-rising flour, self-rising corn meal, pancake flour, prepared mixes, and household baking powder. As an ingredient of baking preparations.



"SO LONG, OLD PAINT"

Formula changes are being made almost daily in the laboratories of paint manufacturers. One of the reasons for this is the development of flameproof, resin-based paints containing Victor diammonium phosphate. When this finish is applied on surfaces such as wall board and ceiling tile, the painted surface will only char and swell in the presence of flame. If your product will be improved by flameproofing, you'll find . . . *it pays* to see Victor.

AMMONIUM PHOSPHATES—Typical Uses: Ammoniated dentrifrices, catalyst for resins, chrome dyeing of wool, one-bath dyeing of Decron-wool blends, flameproofing, plant nutrient solutions. Manufacture of yeast, vinegar, bread improvers, and alcohol. Acid cleaner for metal.

BEST WAY TO CLEAN "CHINA CLIPPERS"

To dentists, they're dentures. To most people they're false teeth. In any case, they need to be cleaned regularly. Denture cleaners containing sodium perborate and Victor trisodium phosphate are designed especially for this job. Makers of denture cleaners prefer trisodium phosphate because of its stability in the presence of perborate . . . another case where . . . *it pays* to see Victor.

TRISODIUM PHOSPHATE—Typical Uses: Cleaning compounds, water softeners, processing cheese, boiler water treatment, and denture cleaners.

ALL "BLONDES" ARE BLEACHED

It's a fact that most blonde furniture *is* bleached. The "new look" in television consoles and furniture is the result of bleaching standard woods like oak and mahogany with Victor oxalic acid. The light color adds glamour and sales appeal. In fact, many other products, such as fabrics, straw, and paper can be improved by bleaching. And when you choose oxalic acid . . . *it pays* to see Victor.

OXALIC ACID—Typical Uses: Radiator cleaning compounds, leather processing, bleaching, laundry sour, removing rust stains from marble. Manufacture of metal polishes, blue-prints, and blueing.

PROOF OF THE PUDDING

Instant puddings are a new, fast-selling grocery item. A creamy, smooth texture in a few minutes is a "must," and to get this, pudding makers use Victor disodium phosphate as the buffering agent. Each of the two types of Victor disodium phosphate meets the high purity and uniform quality standards required by food processors. Men "in the know" in the food industry will tell you . . . *it pays* to see Victor.

DISODIUM PHOSPHATE—Typical Uses: Boiler water treatment. Buffer in dye-baths. Casein emulsifier. Buffering agent in process cheese, evaporated milk and instant puddings. Manufacture of pharmaceuticals. Pumping pickle for canned hams.

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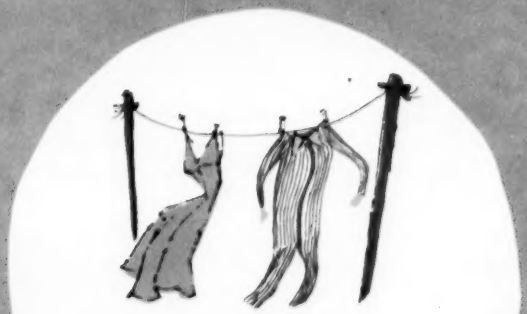

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TETRASODIUM PYROPHOSPHATE—Typical Uses: Soap builder, conditioning oil drilling muds, stabilizing hydrogen peroxide baths, reagent for de-inking newsprint. Manufacture of detergents, and water-softeners. Clay dispersant, anti-pitch agent in paper making.

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- ☐ FLAMEPROOFING PAINTS?
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- ☐ DENTURE CLEANERS?
- ☐ BLEACHING WOOD?
- ☐ POWDERED SOAP?

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Many times, the properties of a new product indicate a variety of applications; however, experimental tests or trial runs are essential before it is used commercially.

During this development period, Victor's technical service staff and the men in our special products division are always available to assist you with their know-how and experience in the field of organic phosphates and other Victor chemicals. The list of new Victor products and new applications is forever growing. Only a few of them are shown here. We will be glad to send you a folder listing more than 45 new chemicals at your request. Just tell us where to mail it. You'll find . . . *it pays* to see Victor.

VICTOR CHEMICAL WORKS

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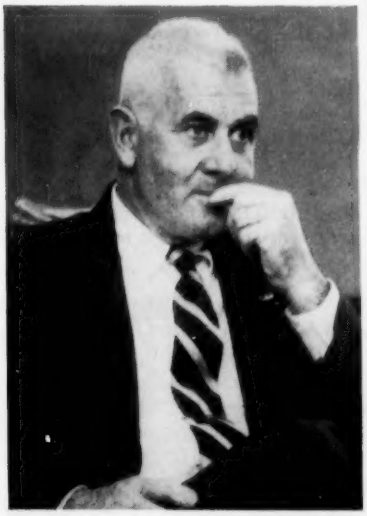
...ORDERED FORM ... TENSION

heating of the oil itself may introduce some vexing heat-exchanger maintenance problems.

Far from pessimistic, Woudhuysen expects to see all these, and other possible "bugs," satisfactorily squashed. This much he can count on: as long as there's a chance of making it work, there will be plenty of thirsty chemical processing plants rooting for his success.



INCO'S LA QUE tosses new corrosion fighter into . . .

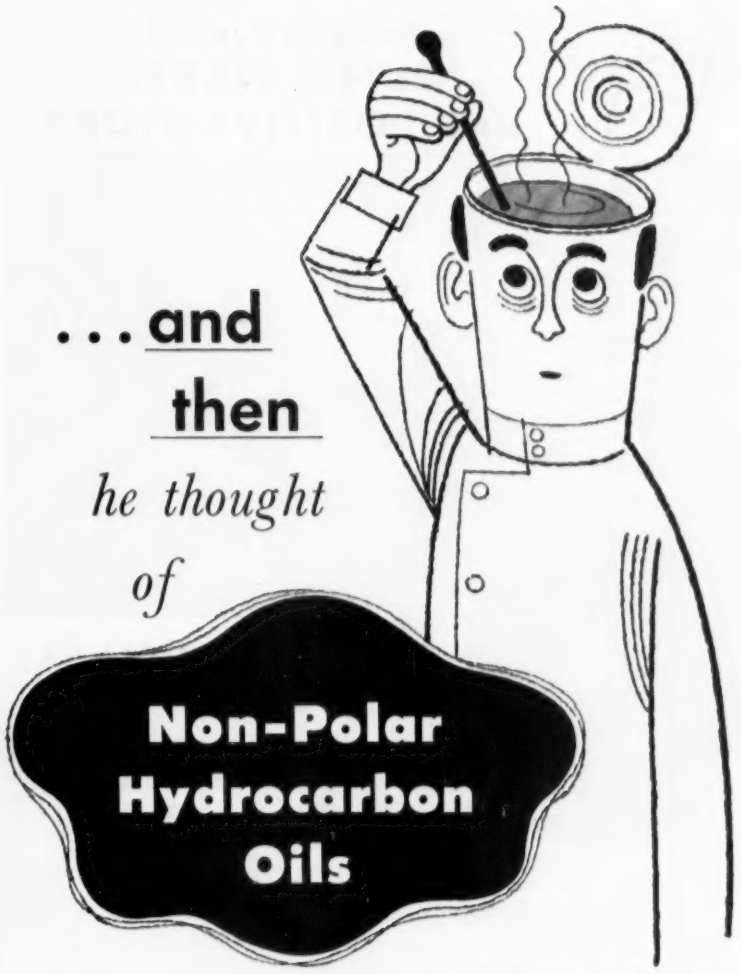
Stainless Competition

Another adversary of chemical corrosion made its debut last week at the opening of International Nickel Co.'s new plating research laboratory (Bayonne, N.J.). It's a new, high-nickel alloy reportedly resistant to hot acids and a gamut of other oxidizing materials.

Potential applications are in the manufacture of oxo chemicals, synthetic detergents, viscose rayon, phosphoric acid (from phosphate rock), and other products that involve the handling of acids (both organic and inorganic).

Called Nionel, the new alloy was developed under the mentorship of Vice-President Frank La Que. Said to be more versatile than stainless steel, the newcomer is expected to be priced proportionately higher (roughly $2 /lb. vs $1.25-$1.50).

Nionel will be bucking competition from other corrosion-resistant ferrous alloys such as Duriron Co.'s (Dayton,



Many a man has gone to extremes when the best, easiest and least expensive solution is close at hand. Take familiar white oils for example. These non-polar hydrocarbon oils are so closely associated with drug and cosmetic products that their unique properties often are overlooked for other uses. Penn-Drake Non-Polar Hydrocarbon Oils are providing exceptional service in a wide variety of applications—including anti-caking, anti-dusting and detackifying agents, reaction media, special lubricants, aliphatic raw materials, extractants, water repellents.

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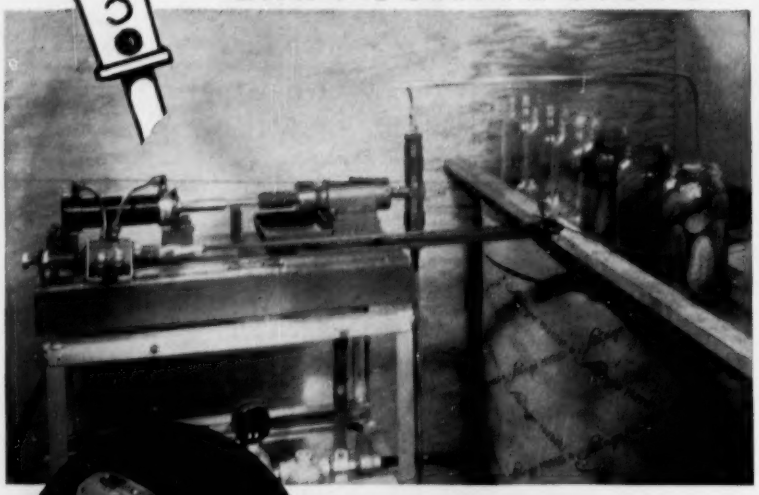
Here's how to get

QUICK STARTS and POSITIVE STOPS



New HILLS-McCANNA *AIR ACTUATED* Metering and Proportioning Pumps

Have *you* a problem involving continuous metering of small volume flows? The new Hills-McCanna air actuated pumps can solve these problems in many cases where conventional pumps are not satisfactory . . . because they have an air cylinder drive. With them you can start fast and accurately and stop immediately — at high or low speeds.

In the photo above a "UP" type pump is used as a "pickle pump" — adding just the right amount of brine to pickle jars. Other uses range from the injection of petroleum additives to putting ink in fountain pens. In all these services, the "UP" is dependable and accurate and may be used with a wide variety of controls.

Hills-McCanna air actuated pumps are available in capacities of 0.1 gph. to 200 gph., with adjustable stroke lengths for positive volume control . . . all are built to the same high engineering standards as Hills-McCanna electrically driven pumps.

Write for Bulletin UP-55 — HILLS-McCANNA CO., 2445 W. Nelson St., Chicago 18, Illinois.

DESIGN DETAILS

- External, interchangeable check valves
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- Positive stroke adjustment
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metering and proportioning pumps

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SAUNDERS TYPE DIAPHRAGM VALVES
FORCE FEED LUBRICATORS • MAGNESIUM ALLOY SAND CASTINGS

CORROSIONEER Copson tests Nionel's resistance, rates it high.

O.) silicon-iron cast alloys and Haines Stellite Co.'s (Kokomo, Ind.) Hastelloy B. But Inco feels that its relatively high nickel content,* in conjunction with molybdenum and copper, gives Nionel a big edge over common stainless steel formulas in resistance to reducing reagents.

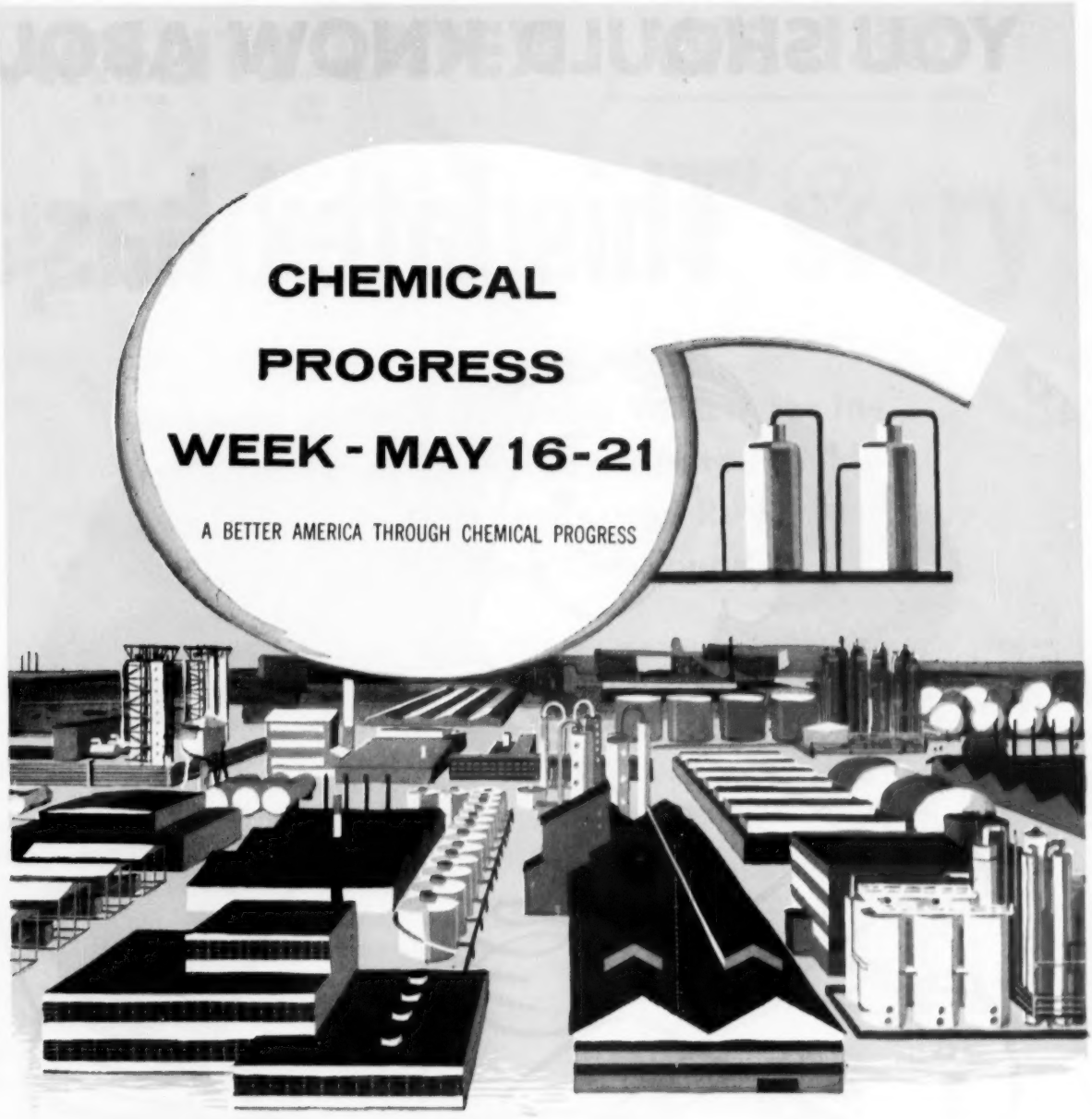
High chromium content (fortified with nickel) is claimed to impart similar resistance to such oxidants as nitric acid, cupric, ferric and mercuric salts (except the chlorides).

According to H. R. Copson, head of the corrosion section of the Bayonne lab, the new alloy is superior to type 316 stainless steel in resistance to stress-corrosion cracking in magnesium chloride solutions. It's also said to be superior in resisting attack by sea water.

However, Inco admits that other alloys (notably Monel metal) are just as good for this purpose, if no other corrosive agent is involved.

Nionel's resistance to sulfuric acid will be its chief claim to process employment. It reportedly withstands concentrations up to 70% at 176 F, up to 40% at boiling temperatures, and all concentrations of the acid at room temperatures. This foreshadows the alloy's evaluation in a variety of sulfuric-handling equipment. Similarly, it's tabbed for trials with hot nitric, hot sulfurous, and hot phosphoric acids.

* Composition of Nionel: 40% Ni, 21% Cr, 31% Fe, 3% Mo, 1.75% Cu, 0.60% Mn, 0.40% Si, 0.05% C.



all industry has helped to make chemical progress

When we think of the astounding progress of the chemical industry, we think also of the progress of every other industry. For only the chemical industry markets its products to all 72 major U.S. industrial groups—and the progress of our industry is linked inseparably with the progress of all other industry.

Obviously, every chemical innovation, to be successful, must find a market. Chemical sales, which have climbed from $4 billion in 1939 to over $20 billion annually today, mean simply that the users of chemicals have been receptive and alert, and have found the way to turn new chemical products and processes to their own advantage.

Columbia-Southern is proud to be a member of the chemical industry and, in marking the second annual Chemical Progress Week, salutes *all* industries for their part in making this progress possible.

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splendid "inside" story

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WC-130, a BAKELITE Brand vinyl acetate resin latex, is a smooth, stable, fast-filming aqueous dispersion. Developed specifically for coatings applications, this latex features marked resistance to foaming and unusual electrolyte tolerance. Paint films based on this latex possess good water resistance together with all these other advantages . . . and show outstanding *retention* of these superior film properties on aging.

Initial exposure data on vinyl acetate resin latices looks very promising. Exterior paint formulations based on latex WC-130 are being exposure tested at sites in Vermont, New Jersey, Pennsylvania and Florida. Bakelite Company's Development Laboratories are continuing extensive investigations of latex WC-130 in many other coatings applications. Advance Technical Bulletin No. 1 gives formulations under test on exterior exposures.

For your information and assistance Technical Bulletin No. 225 provides suggested formulations for interior applications such as plaster and wallboard sealer, various pigmented interior wall paints, wall patching compound, and tinting base together with manufacturing procedure and properties of these products made with BAKELITE latex WC-130. A list of tested pigments and extenders, plus cost data are included. For your free copies of Technical Bulletins No. 1 and No. 225, write Dept GX-34

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SPRAY-TILING CONCRETE: Polyesters go to work at Brookhaven.

Tile in a Can

Polyester coatings, as "liquid tile," have invaded the home-use market, after breaking in as marine finishes.

Currently made by a few small firms, the polyesters may be offered soon by some of paint's "Big Ten."

"Their only solvent's a blowtorch"—it's a strong statement, but it's typical of the terms being used to describe the newest development in home-applicable decorative-protective coatings, the polyester resins. Still pretty small-volume products in the giant paint industry, the polyesters have a packet of advantages that promise a substantial market:

- They can be applied by sprayer, brush or roller (depending on type.)
- They cover cracks, small holes; formulations can be made self-leveling.
- They produce a hard, glass-like coat anywhere from 1/32 to 3 in. thick—and speedily.
- They're resistant to virtually every known solvent.
- They're resistant to impact, can be made in a variety of colors, will adhere to concrete, wood, even metal.

It's no wonder that Ev-R-Shield Products, Inc. (Joppa, Md.), which offered one of the pioneering compounds, Glascote, last February,* was joined last week by American Metaseal Mfg. Corp. (West New York, N. J.) and Plastic Coat. Pen-Mar Plastics (Redwood City, Calif.) is another firm selling polyester, and at least one top paint producer is on the verge of marketing its own "liquid tile."

Shower Stalls to Laundry Tubs: Liquid tile is a term that best explains the new coatings. With them, a householder can paint on a ¼-in. layer of water-impervious "tile" for a shower stall. Reline laundry tubs. Coat his swimming pool or the top of the kitchen sink.

In industry and the lab, polyesters find a raft of uses, too—as protective coatings for equipment, surfacing for lab workbenches, even for repairing concrete flooring. The polyesters might also find application as traffic paint.

Although it introduced its Glascote largely for consumer use, Ev-R-Shield, for example, is now selling 90% of its production to industrial users.

Marine Birth: It was the do-it-yourself boat enthusiasts, however, who actually got first chance at the polyesters, and cleared the way for general home and factory use. Such products have been available for more than a year from several firms (including, more recently, Sears Roebuck), generally in a kit containing glass-fiber reinforcing tape or cloth.

Polyesters, of course, are nothing new to industry and the process industries: e.g., over two years ago, Brookhaven National Laboratory coated the heavy (40-ton) concrete blocks surrounding its Cosmotron with a coat of Naugatuck Chemical's Vibrin polyester (*see cut*).

Reluctant Majors: Nevertheless, none of the major suppliers of the resin has marketed a home-use product. The ones now sold are those of specialties makers that spotted the market potentials for the easy-to-use polyesters. They aren't basic producers, however—Ev-R-Shield is making its Glascote around Reichhold resin, Metaseal is selling a product based on Pittsburgh Plate Glass Co.'s resin, and Pen-Mar uses Chemical Process Co. products.*

None of the dozen major polyester suppliers queried by CW admitted having a home-marketable product

* Ev-R-Shield first sold its Glascote in the nearby Baltimore area last July.

* There are some differences in these products, in both price and properties: Plastic Coat, for example, is 10-15% solvent (styrene monomer), dries to a "breathing" finish, costs $8.50-14/gal. (depending on color). Glascote sells for $14.95/gal., produces a coating said to be a complete vapor barrier. All cover about 250-300 sq. ft. as ordinarily applied.

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And there is big news on the quality side, also. Your Epon resin-based paint will have excellent adhesion, good leveling qualities, uniform one-coat coverage, unlimited range of colors, good holdout and superior washability . . . a many-ways-better paint which may give you a price advantage, too!

Write today for the technical bulletin SC:54-63, "Epon resin Odorless Architectural Paint Vehicles A-300 and A-301." *Be the first in your area* to take advantage of this new Shell Chemical development.

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now. PPG and Reichhold, of course, have a foot in the door (PPG, in particular, is in a good position to sell retail), and U. S. Industrial Chemicals says it's considering distributing through some firm with consumer outlets. All the others express plenty of interest in the sales progress of the presently offered products.

Cause for Caution: There are several reasons for the slowness with which the polyesters have been introduced:

Although they seem ideal for concrete, there has been some difficulty getting good adherence to wood and nonporous materials like poreclain or metal (Ev-R-Shield claims to have whipped the latter problem).

Another factor is the possible hazard in selling an item of this nature to the do-it-yourselfer—polyesters are combined with cobalt naphthenate (accelerator) and a peroxide catalyst. Mixing the latter two is dangerously explosive. In the home products, the naphthenate is factory-added, and dispersed. User just stirs in the catalyst hardener. There remains, however, the catalyst problem—peroxide is highly flammable.

Also, there's concern that a novice might mishandle the product—if it hardens on areas where it isn't wanted, nothing short of a chisel or a blowtorch will remove it.

Cautionary labeling, and careful dealer instruction—hardware stores seem to be preferred outlets—are the approaches being taken to forestall incorrect use.

Thus, the polyesters are somewhat controversial specialties. But to the firms selling them, there's no doubt about their potential. And the interest of the polyester suppliers indicates they, too, feel the polyesters have a sunny future.

After a Year's Scrutiny

The Office of Technical Services last week released its heretofore-classified report on the shelf life of some 80 chemicals in polyethylene bottles. The report, based on a study by Plax Corp. (Hartford, Conn.),* will be of particular interest to specialties makers considering use of the squeeze bottles.

One particularly interesting generality culled from the study: packagers have been overcautious, if anything, in their estimation of a year's permeability-loss through polyethylene containers.

These earlier estimates, based on 28-day tests (a testing procedure common ever since the bottles were introduced after World War II) have in some cases steered firms away from trying the plastic, whereas tests now show they might have utilized it advantageously.

Moreover, the study permits intelligent forecasting of the suitability of packaging a given product not actually included in the test chemicals by checking results of trial products in the same family group.

Examination Outline: Here's the way the testing program was carried out:

Eighty basic chemicals were selected to illustrate various molecular configurations. Although theoretical aspects were given full consideration, dozens of commercially common products were tested at the most commonly used concentrations.

The materials fell into 16 major groups: inorganic acids, alkalis, organic acids, alcohols, polyhydric alcohols, esters, ethers, aldehydes, ketones, anhydrides, terpenes, nitrogen-containing compounds, aliphatic hydrocarbons, aromatic hydrocarbons, chlorinated hydrocarbons, and miscellaneous.

Bottles were standard 4-oz. Plax polyethylene bottles blown from a single blend of Bakelite's DE-2400 molding powder with a melt index of 1.04 decigrams/minute. The closures used were standard phenolic 24-mm. screw caps.

The empty bottles were individually weighed and the weight marked on each. They were then weighed (*see cut*) with the caps in place, then filled (to approximately shoulder height) with the respective materials, conditioned at the various temperatures, and reweighed.

Climate Choice: One group of bottles was held at 70 F $\pm$ 2 and 50% relative humidity for one year; another group was held at 32 F, a third group at 100 F, a fourth at 130 F, and one group was conditioned at 165 F for a maximum of 155 days.

During the shelf-life testing, each of the bottles was weighed after intervals of one day, five days, ten days, one month, three months, six months, nine months, and one year. The weight change was recorded in milligrams.

The permeability factor (P factor) was obtained by averaging weight loss for five test-bottle samples each at 70° and 100° and for three bottles each at 32, 130 and 165°. These losses were then plotted against time and the slope of the curve taken as the P factor. The slope was taken at that portion of the curve where apparent equilibrium had been obtained.

BOTTLE GAUGING: Wall thickness is a factor in permeability.

Data Plus: This long-term study is probably the most definitive work in the already large library of data on polyethylene bottles. And, for the most part, it confirms work already done.

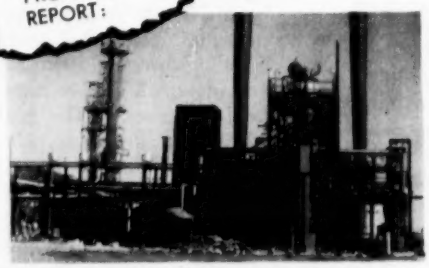
Besides indicating that a wider range of products is polyethylene-packagable than had been previously thought, the work showed that only in 11 of the 360 material-temperature combinations was the polyethylene found to degrade or be affected seriously in tensile strength.

Stress corrosion cracking, tested at a stress level of 800 psi., occurred with only 17 of the 80 materials checked. In these 17 cases, the researchers believe that if the bottles were used without a spray plug, or if a normal

* Work was conducted by Plax under Contract AF 33 (616)-112, RDO 618-11, from Wright Air Development Center and was reported in Technical Report 53-113, Part I in "Investigation of the Shelf Life of Liquids in Polyethylene Bottles", by Pinsky, Nielsen and Parliman.

Spencer Service is Wonderful

POLYETHYLENE PROGRESS REPORT:



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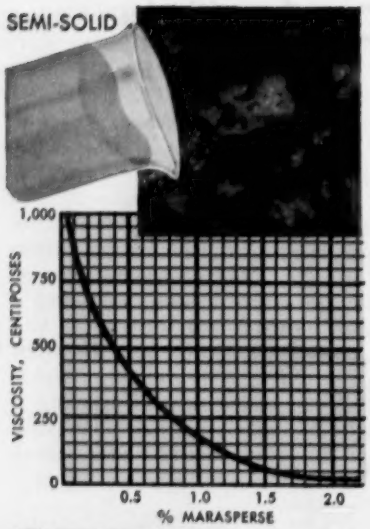

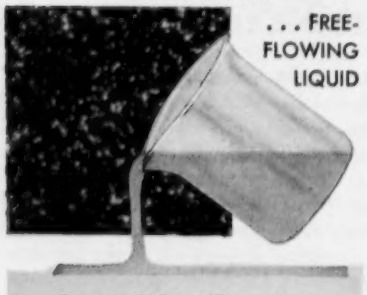

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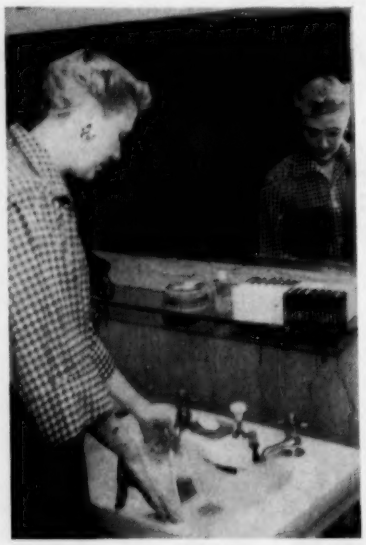
plug fit (below 600 psi.) were used, there would be no tendency toward stress corrosion cracking.

The key point of the study, in the mind of Plax and other bottle makers, is that the polyethylene bottle, low in weight, unbreakable, cheap to ship, and chemically inert, is proved anything but a luxury package.



EXCHANGING IONS: For making girls prettier, drinks better.

It's in the Bag

If you can't think of a new product to make, you might do as well making an old one in a new form so it can be used differently. Using ion-exchange resins to demineralize water for such home uses as steam irons isn't new. Products such as Crystal Research Laboratories' (Hartford, Conn.) Deeminac, and Felwin Inc.'s (Chicago) Water-Boy, which require pouring water through a resin-containing unit, have been on the market several years. But Amerdec Corp. (Chicago) has something new—an ion exchange bag called Delete, which is dunked into a basin of water.

"Swishing resin through water is a lot less cumbersome for home use than pouring water through resin," reasons Amerdec's Hal Ellison.

Priced at $2 with a plastic case, $1.50 without, Delete will soon be sold in two formulations in a campaign based on two years' market study. Aiming beyond the old steam iron and automobile battery market, Ellison has specified formula No. 1 (pH 5-6, good for 350-400 dips of 20-30 seconds each) for water for hand and face washing, formula No. 2 (pH 6-7, good for 5,000-6,000 cups) for cooking water. Ellison is enthusiastic about complexion-care uses: "It helps the skin resist alkaline soaps and creams, keeps residues of metallic and other ions off the skin."

With a partner, Ellison formerly headed the American Demineralizer Co. (Chicago), sold large plastic demineralizers to local restaurants and clubs.

At that time, their favorite selling gimmick was to buy a prospect two drinks, one made with the prospect's best water—the other with water treated by American's unit—to show how treatment improved water palatability. Business was going well when the "tea-bag" idea came to him.

As finally developed, Delete consists of a patented polyethylene-lined nylon bag (Food & Drug Administration requires an inert material) containing a blend of National Aluminate Corp.'s anion exchangers Nalcite SAR and WBR, cation exchanger HCR. Amerdec treats these to eliminate the flat taste common in ion-exchanged water. An indicator tells users when to buy a new bag.

Ellison "test-marketed" Delete through out-of-town friends, Rotary and Women's clubs, and a limited mail-order business. While mulling over the resulting comments, Ellison had his product thrust upon the market by a mention in a local newspaper column, which brought in 1,300 calls.

Already, hard-watered Chicago's response to "Delete" has been so encouraging that Ellison has sold out his interest in American Demineralizer and is devoting full time to Amerdec and the home market. His goal: a Delete bag hanging in every kitchen or bathroom where demineralized water is wanted.

•

Second Chore: Monsanto has investigated the paint-removing qualities of its phosphate ester hydraulic fluids. Harry Gamrath (St. Louis) has patented the use of nonflammable fluent alkyl diaryl phosphate ester as a paint-, varnish- and lacquer-remover (U.S. Pat. 2,704,278 assigned to Monsanto).

•

Two to Peel It: Ralph Stevens (Toledo,

Ethyl Bromide

FOR HIGHER YIELDS

IT'S THE LOWER COST of the manufactured *quality* product that counts . . . not the cost of the ingredients you use. That's why Michigan Chemical's Ethyl Bromide often is an economical intermediate to employ for the introduction of the ethyl radical. When combined with another intermediate, Ethyl Bromide can result in a higher yield of finished product with overall lower costs and higher production. Try it.

SPECIFICATIONS:

Specific gravity of material at 20°C. compared to that of water at 4°C.	1.450 to 1.465
Distillation range, 5 to 95% within	3°C.
Distillation range to include	38.4°C.
Acidity	Neutral
Color	Water white and clear

Michigan Chemical Corporation, for almost twenty years a quality producer of chemicals, offers a series of pure Bromides, among them being Ethyl Bromide, Monobromobenzene, Cyclopentyl Bromide and Hydrobromic Acid, specially made for use in pharmaceuticals. Write for further information or catalog.

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Plants in: Clifton, N.J., Carlstadt, N.J., Los Angeles, Calif.

SPECIALTIES

O.) has also worked out a way to remove paint films (U.S. Pat. 2,705,-207): he applies a halogen-containing alkene (no more than two carbon atoms), then (after this has softened the film) coats it with an admixture of liquid hydrocarbon, alcohol, and an aliphatic carboxylic acid ester. Paint film is then easily removable.

•

Rust Brake: An aluminum paint to slow the rusting of iron and steel has been devised by Gordon Babcock and Francis Rethwisch of Reynolds Metals Co. (U.S. Pat. 2,701,772). It features a pigment of flake aluminum and strontium chromate—the chromate comprising one-fourth or more of the pigment mixture.

•

Germ-Killing Pad: Louis Lerner, Phil Kalech Co. (Chicago), has come up with a novel way to make a germ-killing sheet or pad (U.S. Pat. 2,702,-780). He impregnates a cloth with a hydrophilic water-insoluble cellulosic gel, adds an anionic surface-active agent and a cationic germicidal agent. The bacteriocide, about two-thirds of the surface-active material present, is released when the sheet is immersed in water—a predetermined amount of water used with a sheet of certain size gives a germicidal solution of known strength, which can be applied to wounds by the carrier sheet.

•

Machinable Ceramic: Synthetic fluorine-mica (85-98%) and orthophosphoric acid and its salts (2-15%) go into a machinable ceramic material (U.S. Pat. 2,704,261) developed by Jay Comeforo (Norris, Tex.). The mixture is cold-formed, then fired at 900-1300 C.

•

On the Move: Offices of Gallowhur

Atomic Check on Mealy Bugs

IT LOOKS like a keg of beer, but it's part of a new idea in combating insects. Being loaded on the railroad car for shipment to Africa's Gold Coast is a concrete-shielded drum of radioactive material from the Atomic Energy Research Establishment at Harwell, England. In Africa, studies will be made on mealy bugs that have been fed radioactive materials—their diet and movements can be followed, the best ways to prevent their attacking cacao trees can be found.

Another new development using

B. F. Goodrich Chemical *raw materials*

B. F. Goodrich Chemical Company does not make these sports cars. We supply only the Geon resin.

Rigid Vinyl Rides a Winner!

THESE 5-foot models of a famous sports car—prizes in a recent contest—had to be made on a hurry-up schedule and a hold-it-down budget. Using high impact rigid vinyl made from Geon resin, the fabricator was able to turn the cars out quickly, cheaply, and easily.

Oven-heated sheets pre-cut to size were placed in an inexpensive forming die and deep drawn. The whole cycle, heating included, took less than ten minutes. The fabrication included ingenious vacuum-formed under-cut sections to match the design of the parent model.

This is typical of the fine detail work which can be formed from versatile Geon without incurring heavy tooling costs. It may suggest an improvement, a new idea, or a way to save money or time in your own operations.

Geon is available in many forms, including materials for colorful flexible upholstery, long-lasting floor coverings, tough insulation for wires, durable coatings, sponges, and many more. For information on Geon materials and applications, please write Dept. K-5, B. F. Goodrich Chemical Company, Rose Building, Cleveland 15, Ohio. Cable address: Goodchemco. In Canada: Kitchener, Ontario.

GEON RESINS • GOOD-RITE PLASTICIZERS . . . the ideal team to make products easier, better and more saleable.

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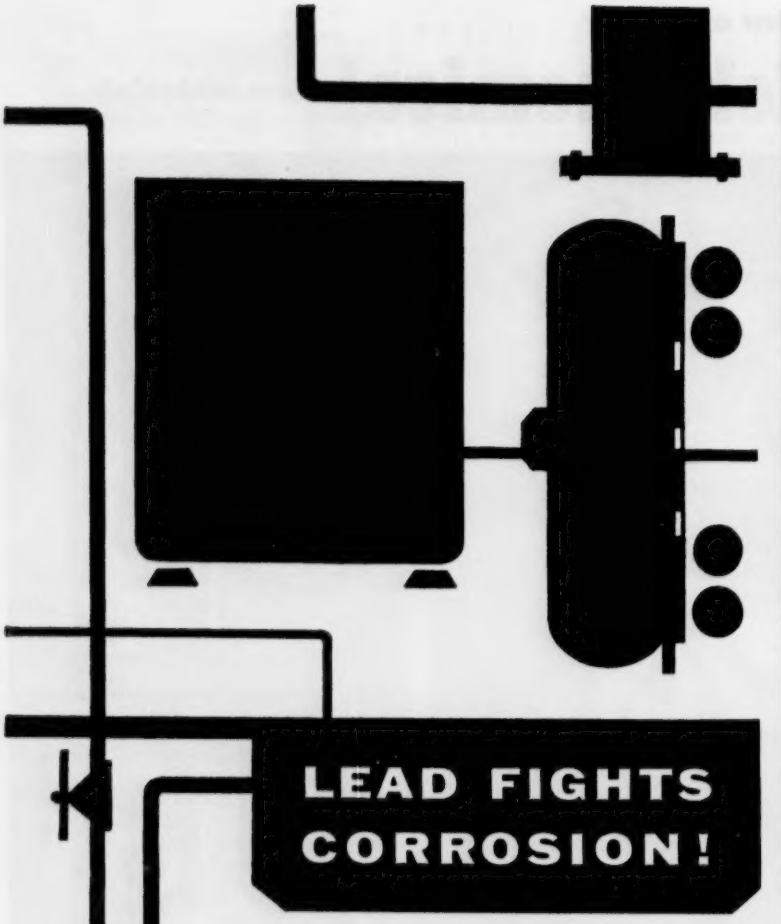

Lead is the most satisfactory construction material for equipment used in the production of many acids and other chemicals; for pickling, plating and anodizing tanks; in the control of air pollution and in waste recovery.

Federated sales engineers will give you the best technical help with your lead application problems. They can determine the most economical kinds and thicknesses of lead to use for handling or storing corrosives at various temperatures and working pressures.

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For any information on the use of lead and lead products, write to Federated's Corrosion Advisory Service at the address below or at any of Federated's 13 plants and 23 sales offices across the nation. Or send for Bulletin No. 162, Lead Handbook for the Chemical Process Industries.

Federated first in the new corrosion field FMD

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SPECIALTIES . . . .

Chemical Corp., manufacturer of agricultural and industrial chemicals, will be moved from New York to the Ossining, N.Y., plant. The move is part of a long-range plan to integrate activities of the firm. Products include fungicides, herbicides, quaternary ammonium compounds, orchard sprays and slime control chemicals.

• Rexall Drugs, Inc., is moving its toiletries manufacturing department from Boston to St. Louis. The Boston facilities will be expanded with a $600,000 drug warehouse.

•

On the Increase: Benjamin Moore & Co. (New York) has added Sillers Paint & Varnish Co. (Los Angeles) as an affiliate. No personnel changes are contemplated.

• Commercial Ink & Lacquer Co. (Fair Lawn, N.J.) has acquired and will expand the plant of the Oxford Co. (Hamburg, N.Y.). Materials used in rotogravure printing will be produced for customers in western Pennsylvania and eastern Ohio.

• Paisley Products, Inc., division of Morningstar, Nicol, Inc. (New York), has bought Scriptex Adhesive Products Co. (Philadelphia), will move their operation to Paisley's New York plant. Products include vegetable-base pastes and glues, latex and polyvinyl resin cements and other adhesives sold to paper converters, package manufacturers, distillers, etc.

•

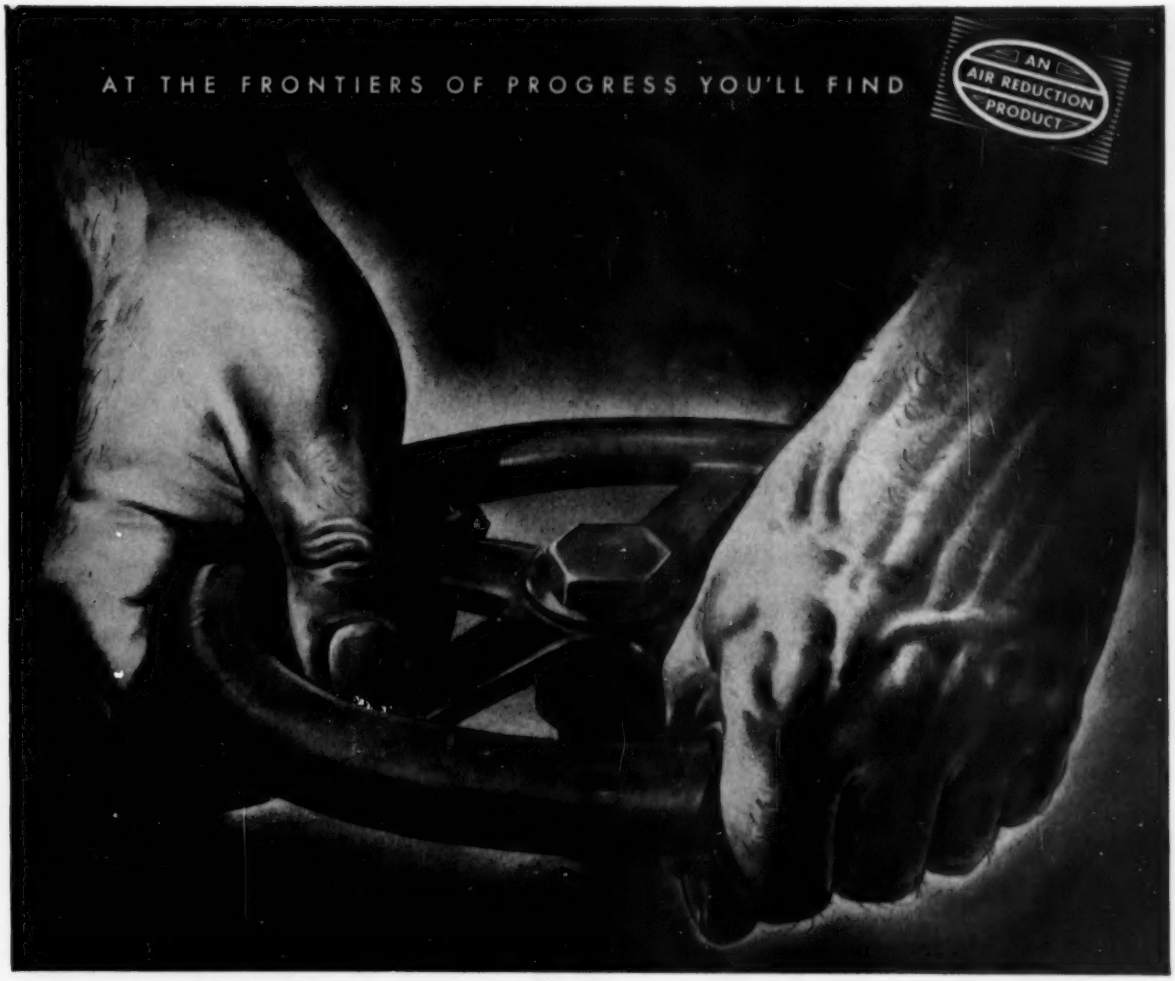
O.K. Spray: Rohm & Haas's Perthane insecticide concentrate has been passed by the government for use in household space aerosols.

•

Beam Absorber: Canadian Inventive and Scientific Associates (Toronto) claims to have a novel coating—one that will absorb radar beams. The firm says the coating is a Swiss invention, is effective with all-wavelength radar. It is said to be under test by the U. S. government, but this allegation is not confirmed. The product is apparently organic based, is said to be acid- and alkaline-resistant.

•

Can Closer: A revolving plastic top for metal cans makes it possible to reseal the can, pour, or sift the contents. The disc has a wedge-shaped opening on one side and perforations on the other; after opening by inserting a beer-can opener through the



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APPLICATION: Promoting reaction of steam, air and natural gas in reforming furnaces to produce ammonia synthesis gas.

TECHNICAL SERVICE of Girdler demonstrated that a switch to its newly developed G-29 would result in an appreciable increase in the ammonia production.

RESULTS: Greater activity of G-29 enables customer to increase ammonia production about 40% when required. This is accomplished with no appreciable increase of fuel consumption per unit of ammonia produced.

Find out how Girdler Catalyst Technical Service can help *you!* Write for Bulletin G-260.

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SPECIALTIES . . . .

wedge, the top can be turned to close the can. By twirling till the perforations cover the hole, a sifter is made. American Can Co., developer of the top, hopes it will extend the use of cans to products such as aspirin, vitamins, grass seed, bath salts, powdered cleaners and glue.

•

All Dishes, Too: For automatic dishwashers, Monsanto is now selling a new All formula—Dishwasher All (*CW, March 19, p. 108*). For machine washing, it is said to hasten penetration and softening of dried-on foods, dissolve greases, suspend both grease and grease-and-food particles for free rinsing down the drain. They've been testing it in cooperation with appliance makers.

•

Pest Chaser: Toxaphene and 4-chlorophenyl ester of 4-chlorobenzene sulfonic acid go into a mite and insect control compound devised by Dow's Eugene Kenaga (U.S. Pat. 2,705,-212). The ingredients are said to be mutually activating.

•

Wire and Paint: A new high-temperature wire enamel, designed to exceed Class B operating conditions, is being made by Schenectady Varnish Co. (Schenectady, N.Y.) Called Isonel, and selling at $3.75/gal., the enamel can be used on automatic winding equipment and may be further treated with impregnating varnish. Maker claims it may be run by die or dip method on conventional ovens as fast as Formvar and 55° hotter.

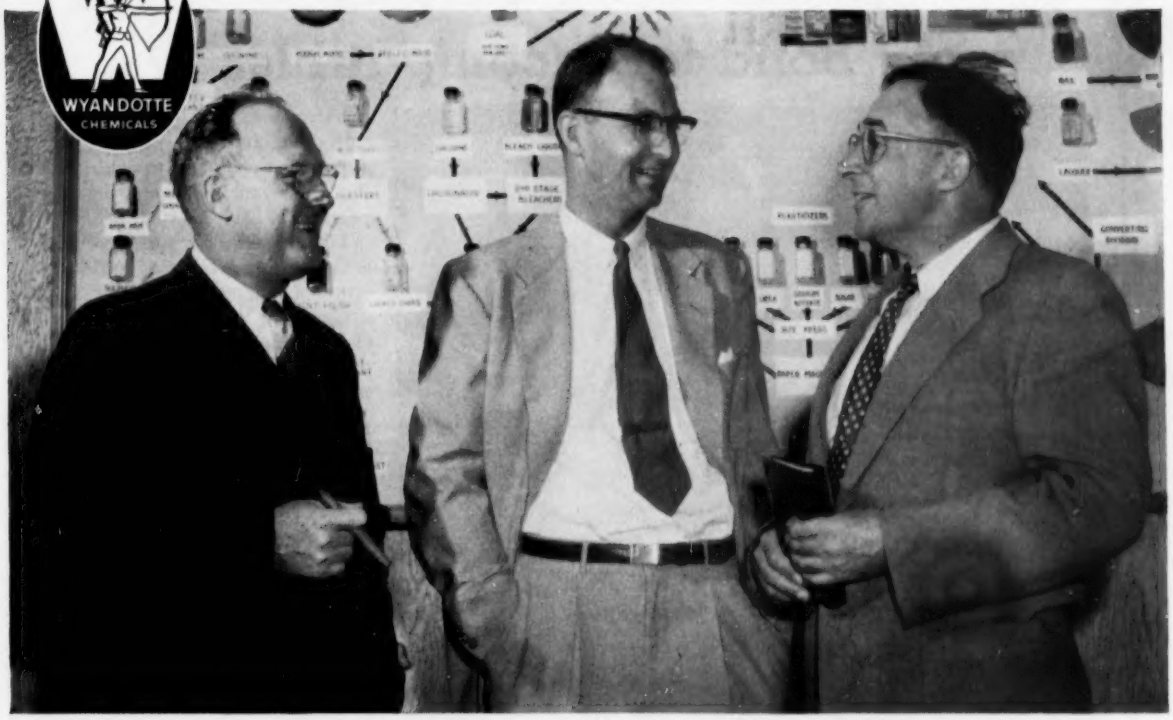
•

Spring of Beads: Being test marketed for home lawns and gardens use this spring is a new high-analysis, soluble fertilizer in bead form. Plantrons, a product of Olin Mathieson, is patterned after the firm's pelletized commercial fertilizers. Basically 12% nitrogen, 24% phosphorus and 12% potassium, the beads also contain 0.1% each of the trace elements, iron, copper and zinc. Added for homeowners: a mint odor and a green color. Packages range through 4-oz., 1½-lb., 5-lb., 10-lb., and 25-lb. sizes, the two biggest ones doubling as spreaders when wire handle is attached.

•

Aerosol Auto Wax: Liquid Glaze (Lansing, Mich.) has a liquid aerosol polish for cars at $2.95. Spray it on; wipe to shine.

Dependable Source for Chemical Raw Materials



R. E. Harper (left), director of purchases, and William R. Haselton, Rhinelander's manager of manufacturing, talk over chemical needs with Wyandotte Representative J. C. Mills.

"Wyandotte has been an outstanding supplier of chemical raw materials"

– R. E. Harper, director of purchases, Rhinelander Paper Co.

Rhinelander Paper Co., Rhinelander, Wisc., is the world's largest manufacturer of two specialty papers – glassine and greaseproof – which are produced in hundreds of variations, each tailor-made for a specific use.

A hand-picked executive team not only has guided Rhinelander to a top position in its field, but also has joined with other paper companies to perpetuate America's forests.

With such an operation, you would expect Rhinelander suppliers to be hand-picked – and they are. The formula is clear-cut and concise. As R. E. Harper, Rhinelander's director of purchases, states: "We are proud of all our suppliers. They are a continuing factor in our success. Wyandotte has been an outstanding supplier of chemical raw materials to us for more than 10 years, and for just two reasons: dependability and service. We currently buy Soda Ash, Chlorine and Caustic from Wyandotte.

"We appreciate Wyandotte's constant representation in our area, and their years of experience in serving the paper industry almost parallel our own."

If you want a source of chemical raw materials with a background of years of experience with many industries, contact Wyandotte. You will find Wyandotte big enough to serve all your needs, yet small enough to short-circuit needless red tape in the solution of chemical problems in our area of experience. We invite your inquiries. *Wyandotte Chemicals Corporation, Wyandotte, Michigan. Offices in principal cities.*

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target

Bond for Incompatibles

GOODYEAR'S OSTERHOF: His problem is keeping tread on the tire.

Put yourself in the rubber industry's place, and you will have new insight into the meaning of frustration. New polyurethane rubbers are unexcelled in wear resistance; but their incompatibility with other rubbers is keeping tire companies from taking commercial advantage of their rugged qualities.

Because of cost (expected to be about 35-50¢/lb. on a production basis) and high heat buildup characteristics, polyurethane rubber is not desirable for a complete tire. But by using polyurethane only as a tread on a carcass of natural or synthetic rubber, its toughness can be utilized with little extra outlay.

The problem: anchoring the polyurethane tread to the carcass. Polyurethanes and other rubbers show no affinity for one another under heat or pressure. What is needed: an adhesive for the various rubbers—a bond that will keep them from working apart in rough use from 50 to 350 F.

Available bonding agents have not proved up to the job. So tire makers have set out to develop one.

This is today's progress picture: Firestone Tire & Rubber reports that its polyurethane-treaded tires have given "complete satisfaction" in tests, but concedes that its current bonding process makes the cost of the tire almost prohibitive.

Goodyear Tire & Rubber, among others (Goodrich, U.S. Rubber, General Tire) that are tackling the problem, has also achieved some success. Goodyear's bonding agent, states company research manager Jud Osterhof, is "a special type of copolymer, containing molecules that adhere to both the GR-S—or natural rubber—and the polyurethane tread."

Subject of a patent application, the copolymer is showing well in tests. But once in a while, puzzles Osterhof, a tread comes loose after only 1,000 miles. The problem, therefore, has not been finally solved; opportunity still exists for a polymer company to undertake the di-isocyanate research that appears most likely to yield results.

Potential reward for success is a chemical market measurable in terms of millions of tires.

Goodyear has road-tested specially made hybrid tires—polyurethane tread on GR-S carcass—for the past five years. Osterhof reveals that the polyurethane tread lasts two to three times longer than the best synthetic rubber.

Next year, the company will launch tests of truck tires, considered to be the best short-term market for polyurethane rubber. In defense of this point of view, Osterhof asks: "What does a 100,000-mile tire mean to you, if you trade your car in every two years or so?" In time, however, the growth of an extensive network of high-speed superhighways may spark demand for tires that don't rapidly wear down at speeds of 100 mph.

Meanwhile, the big market for polyurethane rubber will be in truck and heavy-duty tires. Here, Osterhof believes, safety will prove to be more important than increased service life. Thanks to the high wear resistance of polyurethane rubber, tire treads would be thinner, generate less heat (hence be less subject to blowouts) at high speeds than thick natural-rubber* treads.

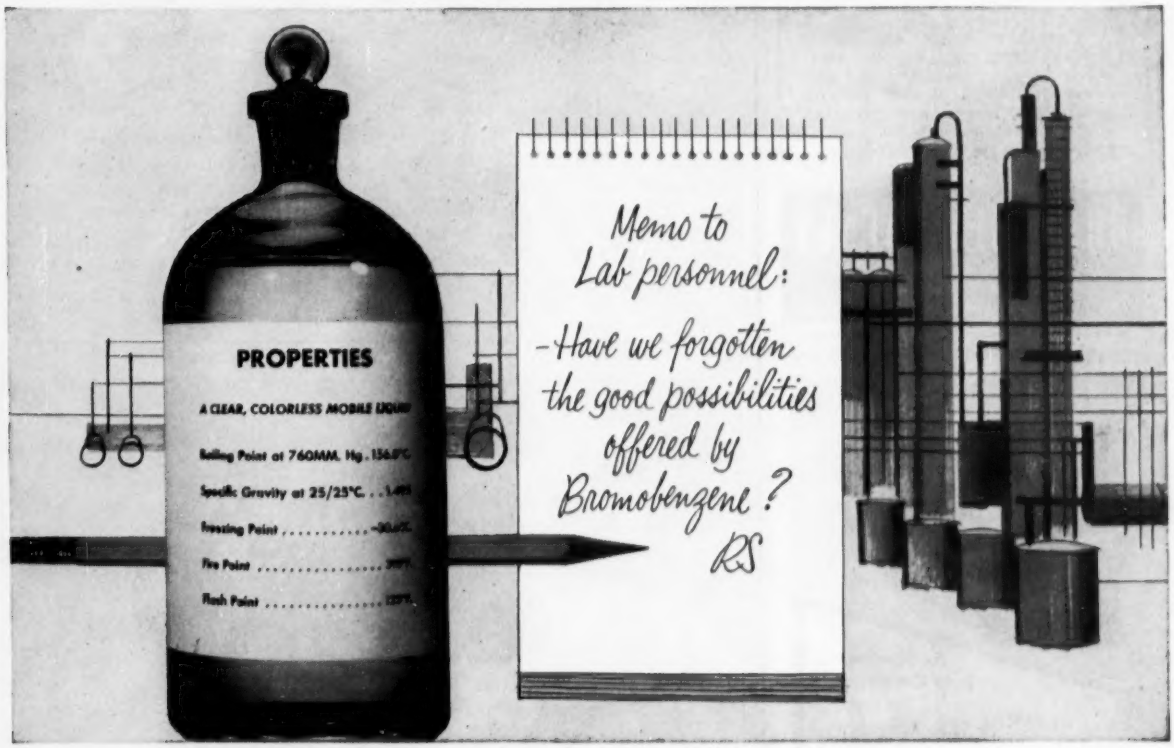
About 30% of all the rubber annually consumed in this country goes into heavy-duty tires for trucks, buses, aircraft and ordnance vehicles. It's an intriguing market for adhesives researchers to contemplate. Their zeal may be intensified by Osterhof's revelation that polyurethane treads are now showing consistently good wear qualities. The problem, he reiterates, is to get a bonding agent that can keep the tread on the tire.

* Heavy-duty tires are made from natural rubber. That's because synthetics build up heat faster than natural, therefore constitute a greater hazard. Since natural rubber wears relatively rapidly, truck tires have extremely thick treads.

DOW

INTEREST IN BROMOBENZENE AIDS RESEARCH AND PRODUCTION

Investigation of this chemical's dependability in reactions and stability in process equipment can pay you dividends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RS

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Progress Report

The facts on last year's progress in synthetic fuels research were given to Congress last week by Interior Secretary Douglas McKay.

Highlight of his report was the disclosure that "a chemical manufacturer" had installed commercial-scale equipment developed by Bureau of Mines' Morgantown, W. Va., researchers for gasifying coal at atmospheric pressure. The company: Du Pont, which has the equipment at Belle, W. Va.

With industry's acceptance of atmospheric-pressure gasification, the bureau's work on the process was discontinued. Efforts are now concentrated on the development of practical apparatus for pressure gasification.

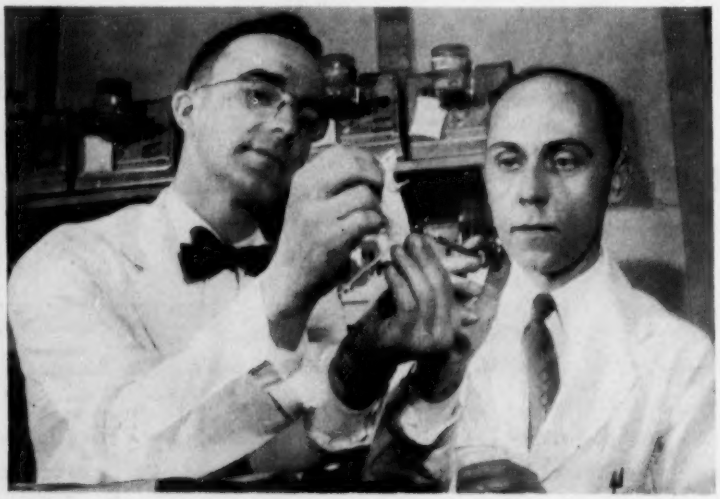
Oil-from-shale studies also moved forward, the bureau reports. Researchers at Rifle, Colo., discovered that secondary cracking, which causes retorting difficulties and interferes with oil yield, can be controlled by adding salt water to the raw shale. On the basis of research at Rifle, avers the bureau, Union Oil is blueprinting a large oil-shale pilot plant.

The oil-from-coal program was highlighted by the first pilot-plant tests of a single-step hydrogenation process that reportedly gives nearly complete conversion of coal into heavy oil.

Redesign of the reactor, however, is being pushed in an effort to eliminate overheating, boost yields of gasoline and gaseous hydrocarbons. Additional tests are scheduled for later this year.

Among other research results detailed by McKay: discovery that oxidized steel wool makes a highly active Fischer-Tropsch catalyst. It was further found that steel turnings, as well as other types of catalysts, could be restored by injecting alcoholic potassium hydroxide into the reactor.

During the current year, its eleventh, the bureau's synthetic fuels branch will travel familiar roads. Research continues on coal gasification, underground gasification, coal to oil, and oil from shale.

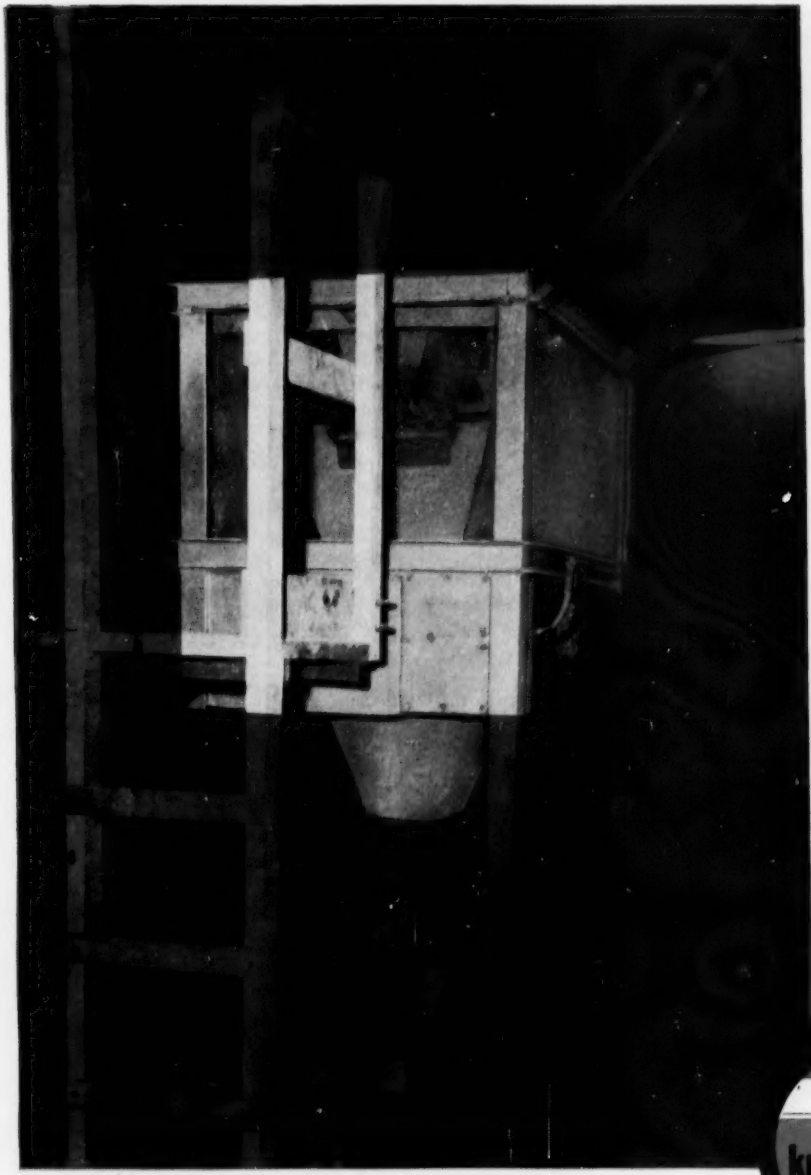


Seeking the Threshold

ANYONE CAUGHT in an H-bomb blast will likely have small use for a headache powder. But the question—How does radiation affect a person's reaction to pain-killing drugs?—is germane to the $224-million/year analgesics-selling segment of the pharmaceutical industry. Seeking an answer are University of Chicago researchers John Doull (*left*) and Kenneth Dubois. They are injecting analgesic into an irradiated mouse prior to testing the animal's pain threshold. Object: to determine whether more drug is needed.

Kraft Bag's NEW Packer

delivers greater accuracy and higher production at lower cost!



Kraft Bag Corporation the most completely integrated manufacturer of multiwall bags in the industry, is now marketing The **Kraftpacker,** an automatic open mouth bag filling machine that increases production and reduces packaging costs at an almost unbelievable rate.

The **Kraftpacker** maintains accuracy to within a few ounces, plus or minus, even at speeds up to 24-100 lb. bags a minute—*with one operator!*

Costing little money to buy, requiring little maintenance for steady operation, the **Kraftpacker** is a proved money-saver in every way... affording still greater economies for those who convert from valve bags.

There's a machine in operation near you. We shall be glad to arrange for you to see it.

You can depend on KRAFT both as a source of supply and as a source of complete satisfaction.

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. . . in key characteristics of olefin high polymers

		Dens.	Solubility: ether	n-heptane	toluene
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	"amorphous"	0.85	s	s	vs
poly-α-butylene	crystalline	0.91	i	s	vs
	"amorphous"	0.87	s	vs	vs
polystyrene	crystalline†	1.08	i	i	vs

*High-molecular-weight material.
†No data given for "amorphous" polystyrene.
Key: i, insoluble; s, soluble; vs, very soluble.

Olefin Upgrader

Crystallinity is the key to the superior properties of new poly-olefins synthesized by Italian "molecular engineers" under the tutelage of Milan Polytechnic's Prof. Giulio Natta.

Possessing higher densities, higher melting points and lower solubilities in organic solvents than do the corresponding "amorphous" polymers, the materials open a promising new pathway in polymer research.

Natta's polymer team, comprising chemists of both Milan Polytechnic and Montecatini, prepared crystalline polypropylene, poly-α-butylene and polystyrene, compared them with noncrystallizable polymers obtained as by-products of this synthesis. What they found is summarized in the table above. Although melting points of the crystalline polymers, significantly, are omitted, it's reasonably safe to assume (*see table*) that they are substantially higher than those of their "amorphous" opposite numbers.

In the case of the "amorphous" varieties, melting points are 65 and 75 C for polypropylene and poly-α-butylene, respectively. Clue to the missing melting points may be found in Natta's polystyrene results. Although they, too, lack melting-point data, *CW* learned (*CW, April 2, p. 36*) that his new polystyrene has a melting point of about 200 C. Proportional improvements are not unreasonable for the other crystalline polymers.

The polystyrene will reportedly be produced by Montecatini. Whether other similarly upgraded poly-olefins developed by Natta are nearing commercialization is difficult to ascertain, but there's strong feeling that, as a result of his discovery, crystallinity will be an increasingly important factor in the development of new materials in this field.

Prior to this latest disclosure,* no crystalline polymers of olefins containing asymmetric carbon atoms in the main chain have been reported. Special heterogeneous solid catalysts, of unrevealed identity, enabled the Italian chemists to break this new ground.

Depending on the structure of the catalyst, they report, different amounts (ranging from 0-100%) of the polymerization products are crystallizable, can be separated from the much-more-soluble noncrystalline polymers by solvent extraction.

Aside from its short-term significance, this research is important in shedding new light on fundamental polymer behavior. From X-ray reflections of drawn fibers, the Italian chemists deduced the structures of the new crystalline materials. Regularity is the key to their findings; all the asymmetric atoms (for long stretches) along the main chain have the same configuration.

This discovery has already been put to use in accounting for the behavior of another interesting breed of polymers: crystalline polyalkylvinyl ethers.

* In the *Journal of the American Chemical Society*, Vol. 77, No. 6.

Nylon Candidates?

Another basic polymer research contribution is a new series of nylon-related polyamides formed by polymerization of 2,2'-bis-[5(4H)-oxazolones] with diamines. Synthesized by Du Pont researchers Charles Cleaver and Burt Pratt, the new members are less crystalline than conventional polyamides, don't produce nylon's high degree of orientation during cold drawing. But they do resemble it in other respects (notably solubility in formic acid and *m*-cresol), deserve a look for other than fiber applications.

At the moment, Du Pont isn't pushing commercial development of the newcomers, considers them to be chiefly of research significance. One reason they may hold promise is that room-temperature polymerization is all that is required to produce polymers of high molecular weight. In addition, no smaller molecules (e.g., water, ammonia, or carbon dioxide) are lost during polymerization. Both these traits could mean future manufacturing economies.

Key to research interest in the new polymers is their unusual structure, a cross between conventional polyamides such as polyhexamethyleneadipamide and the newer α-amino acid homopolymers. On the other hand, they degrade on melting, resist attempts to increase their molecular weight by increasing reaction times, temperatures. In the current scramble for nylon know-how, however, new polymers' stay on the laboratory shelf could turn out to be short-lived.

•

Transistor Oven: Said to be well suited for vacuum-processing of transistors, a new oven from Labline, Inc. (Chicago) has a temperature range up to 150 C, features an 11-in.-diameter safety-glass front window, which affords full visibility. The door is specially gasketed to provide a vacuum seal without clamps, utilizes a special extruded seamless silicone gasket.

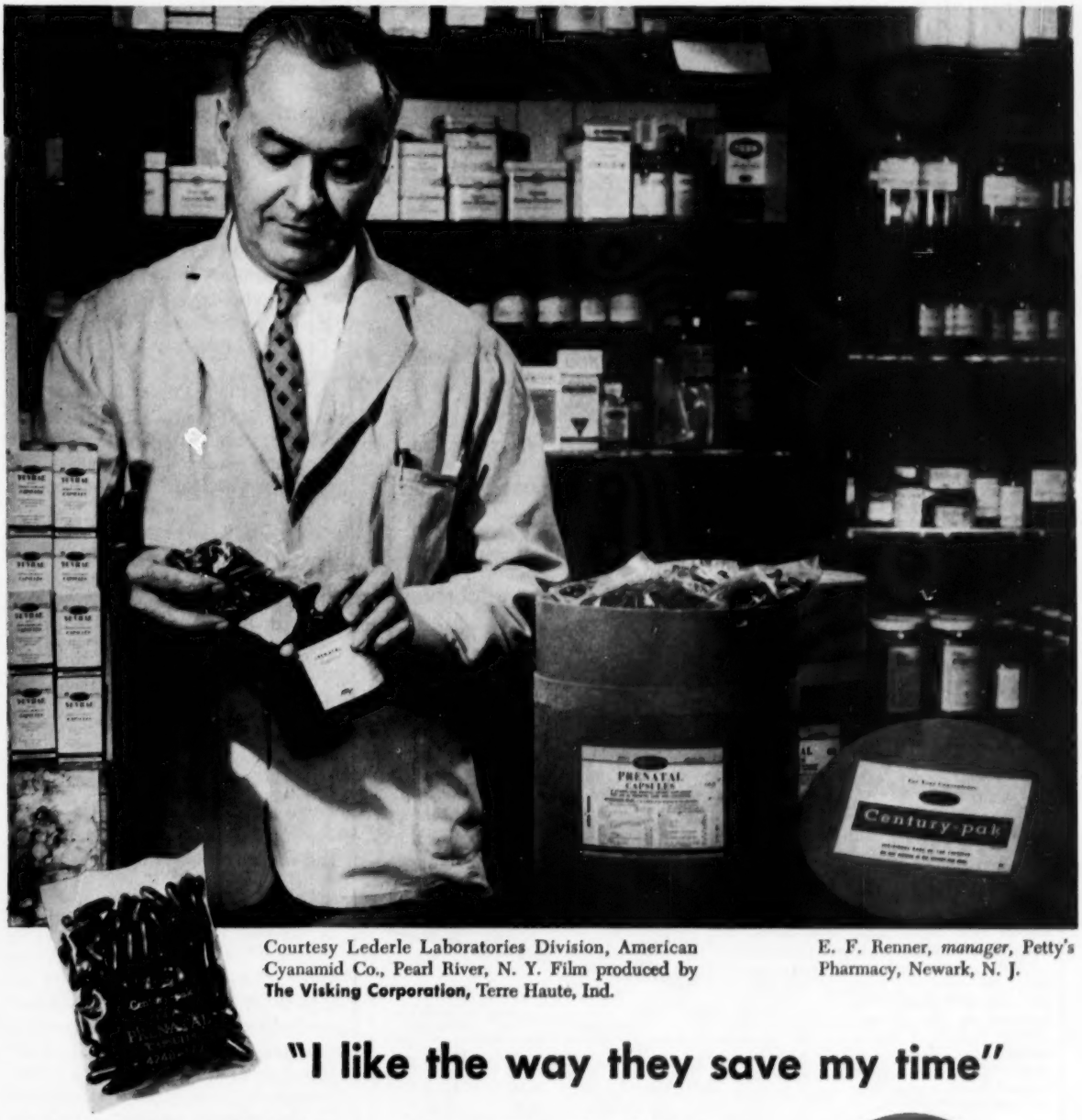
•

Strong Grip: Also from Labline, Inc., a new all-stainless-steel clamp, guaranteed not to break, is offered under the tradename Labline Unbrako. Price: $2.15 each.

•

Kinetin Progress: Kinetin (*CW, March 5, p. 42*), the chemical that restores the power of reproduction to aged

ANOTHER WAY it pays to package in film made of BAKELITE Polyethylene



Courtesy Lederle Laboratories Division, American Cyanamid Co., Pearl River, N. Y. Film produced by **The Visking Corporation,** Terre Haute, Ind.

E. F. Renner, *manager,* Petty's Pharmacy, Newark, N. J.

"I like the way they save my time"

That's what E. F. Renner thinks about CENTURY-PAK . . . Lederle's trade-mark for their canisters of individual polyethylene bags containing 100 precounted capsules. And they certainly are making it easier for druggists to fill orders. Lederle's sales show that.

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It really does pay to think about your packages in terms of film made of BAKELITE Brand Polyethylene. Remember, it's also highly chemical resistant, inert, flexible and withstands below-zero temperatures. For further information write to Dept. BC-34.

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and COWLES Know-How Will Help, Too

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Electrothermal Heating Tapes consist of one or more fabric bands of resistance wire, separated or bordered by bands of high-temperature-resisting glass fibre yarn. The width and length of the various tapes are carefully determined by the current-carrying capacity of the resistance wire. Temperature of 400° C and over can be reached inside a glass tube of 2mm wall thickness.

The tape is simply wound around the body to be heated, and held in position by glass laces at both ends. A suitable control device such as a "Powerstat" or variable autotransformer should be used with the tapes.

THREE TYPES AVAILABLE — UNINSULATED — INSULATED ON ONE SIDE — INSULATED ON BOTH SIDES

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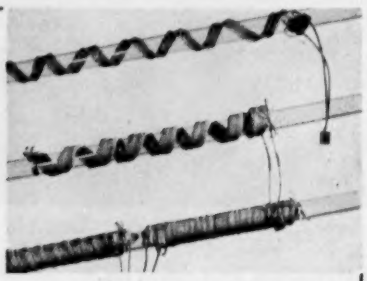

Length in Ft.	Width in Inches	Watts at 115 V.	Amps.	Uninsulated Cat. #65080	Insulated 1 side Cat. #65090	Insulated both sides Cat. #65100
3	1	100	1.6	$ 9.65 ea.	$11.40 ea.	$14.70 ea.
4	1½	250	3.0	12.25 "	14.90 "	18.75 "
5	3	450	4.6	16.65 "	20.15 "	26.45 "
6	3½	500	5.2	19.25 "	22.95 "	29.40 "
2	½	36	0.5			3.50 "
4	½	72	1.0			5.50 "
6	½	108	1.5			7.50 "
8	½	144	2.0			12.00 "
2	1	72	1.0			5.50 "
4	1	144	2.0			8.50 "
6	1	216	2.5			11.50 "
8	1	288	3.0	(Average load of Heating Tapes is 2½ Watts/Sq. in.)		15.00 "
2	2	120	1.5			8.00 "
4	2	240	3.0			13.00 "
6	2	360	4.0			18.00 "
8	2	480	5.0			30.00 "
2	3½	210	2.5			12.00 "
4	3½	420	4.2			19.00 "
6	3½	630	7.5			26.00 "
8	3½	840	10.0			45.00 "

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plant cells, has recently been synthesized by University of Wisconsin researchers Folke Skoog, Carlos Miller, F. M. Strong and Malcolm von Salza. Slated for investigation: possible significance of the compound in cancer.

•

Three Standards: Newly available from Carnegie Institute of Technology (Pittburgh, Pa.) are American Petroleum Institute standard samples of 3,3-dimethyl-1-pentene, 2,5-dimethyl-trans-3-hexene, and 2-methyl-3-ethyl-1-pentene. Price per 5 ml. unit: $50.

•

Bottled in Bulk: Heretofore sold only in pints and quarts, Fisher Scientific Co.'s (Pittsburgh, Pa.) Karl Fischer reagent is now available in bulk. Price: $100/case of four one-gallon bottles.

•

Sun Cell: Researchers at Bell Telephone Laboratories (New York) last week reported that efficiency of the Bell solar battery (*CW, May 15, '54, p. 108*) has been increased from its original 6% to 11%. Bell men responsible for the improved battery (which links together silicon cells to deliver power rates of up to 100 watts /sq. yd. of silicon surface) are K. D. Smith, E. J. Stansbury, C. J. Frosch and D. F. Ciccolella. Research now under way at Bell points to eventual use of the battery in low-power radios and similar equipment.

•

Cancer Quest: A new research project at Illinois Institute of Technology (Chicago) aims to determine how certain chemicals are able to inhibit the growth of cancer tissue. The school has been awarded an $8,087 grant by the National Cancer Institute of the U.S. Public Health Service for a two-year study. Crux of the research will be fundamental studies of enzyme formation by yeast cells, coupled with an investigation of the effect of cancer-chemotherapeutic agents on yeast cell metabolism.

•

Return: Resumption of publication of the *Journal of the Chinese Chemical Society* (interrupted since 1949) is reported by editor-in-chief Daniel Chang. It will be published semiannually at Taipei, Taiwan (Formosa).

•

Atomic Trainees: On May 2, 32 scientists and technicians from 21 nations will begin a special four-week course

A message to CHEMICAL INDUSTRY MANAGEMENT

Here's how you can use

STRATEGIC PURCHASING

to help your company maintain a sound competitive position

As profit margins tighten, your purchasing strategy becomes a vital force for success.

The way you purchase heavy chemicals, for instance, can influence your company's profits in the years ahead.

So it becomes increasingly important for you to seek every possible economic advantage when you select a chemical supplier.

Here, for example, are a few things to look for, when deciding on a source for caustic soda, chlorine, and other chemicals:

1. Supply security. How flexible are your supply lines? For instance, a supplier with plants located on deep water may be able to offer you a choice of rail or water delivery. This can insure you steady supply, in case of rail service interruption.

2. Engineering help. A supplier's engineering staff can often be valuable to you when you are setting up a new chemical process or caustic and chlorine handling systems—not only with advice, but with actual design assistance.

3. Smooth processing. You'll find it helpful to work with the supplier's technical service men who visit you periodically. Often these men can spot potential problems and ward them off before they cause you trouble.

4. Safety programs. Your men can benefit from safety suggestions offered by your supplier. You should have on tap the latest in safety equipment, plus up-to-date information on safe handling of chemicals.

5. Economy. Choose a supplier who wants to help you cut your operating costs; who will go all the way with you in arriving at the best, most advantageous method of shipping and handling for your conditions.

6. Experience. Above all, choose a supplier who is familiar with your industry. It takes years of experience to acquire an understanding of the problems you face, and the know-how to help you solve them quickly and economically.

Are you getting your fair share of these strategic purchasing advantages?

Many of our customers in the chemical industry feel that they get these advantages in buying from Hooker, a supplier of basic materials to the chemical industry for fifty years.

In the light of the growing importance of these factors, isn't this a good time to review your policies on sources of chemical supply?

CHEMICAL PROGRESS WEEK-MAY 16-21

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4-1955

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RESEARCH . . . . . .

in radioisotope techniques at Oak Ridge, Tenn. Sponsored by the Atomic Energy Commission, the project is part of the President's atoms-for-peace program, aims to educate foreign researchers in American tracer techniques.

•

Grease Cone: A new grease-penetration cone, developed by Standard Oil Co. (Ind.) Research Laboratories can now be obtained from Labline, Inc. (Chicago). Design of the cone reportedly correlates with all previous test data, extends usefulness of the standard grease-penetration test.

•

Super Brain: Recently unveiled by Remington Rand (New York), Univac II magnetic core electronic computer reportedly can "memorize" up to 120,000 characters, execute instructions at the rate of 8,000/second. It's a new version of the Univac Scientific Computer that is now being used in classified government studies.

•

Textile Tithe: Trying for a 50% increase in its research fund, the American Assn. of Textile Chemists and Colorists is seeking 200 additional dues-paying corporate members. Goal: a research budget of $75,000/year. Present corporate membership comprises 280 firms. According to AATCC research director Harold Stiegler, the new funds will cover only immediate expansion and improvement needs of the association's research facilities.

Latest result of AATCC research is a new device—named the Accelerotor—that reportedly evaluates wear service and launderability, in a matter of minutes. Previously, these properties required hours to determine.

•

Conference Note: The upcoming (June 6-10) sixth annual conference on industrial research—sponsored by Columbia University's industrial and management engineering department—will explore the human relations aspect of industrial research, probe researcher personality, training, and rewards. It will be keynoted by National Science Foundation director Alan Waterman. His topic: a report on the current status of research and development in the U.S.

•

New Names: Schering's metacortandracin and metacortandralone are now called Prednisone and Prednisolone.

From cake to clothing

Anhydrous Ammonia, one of Atlantic's many petrochemicals, may have an important part in producing the food you eat, the clothing you wear, dozens of things you depend on for better living. That's why you see the miniature oil refinery in the illustration.

This new member of Atlantic's chemical family has a variety of uses. On the farm, for instance, Anhydrous Ammonia is released into the soil where it supplies vital plant food to increase crop yields. Its use in the manufacture of synthetic fibers means new and better fabrics for clothing of all kinds.

Manufacturers rely heavily on ammonia for the making of hundreds of products . . . nitric acid in one plant, explosives in another, plastics in a third. Anhydrous Ammonia is only one of the many chemicals, produced by The Atlantic Refining Company, for which industry of all kinds is constantly finding new uses.

Atlantic sales engineers will be glad to work with your technical personnel to help improve quality, reduce costs, or develop new products. Write for information; just ask us how Atlantic petrochemicals can be helpful to you. The Atlantic Refining Company, Dept. H-43, 260 South Broad Street, Philadelphia 1, Pa.

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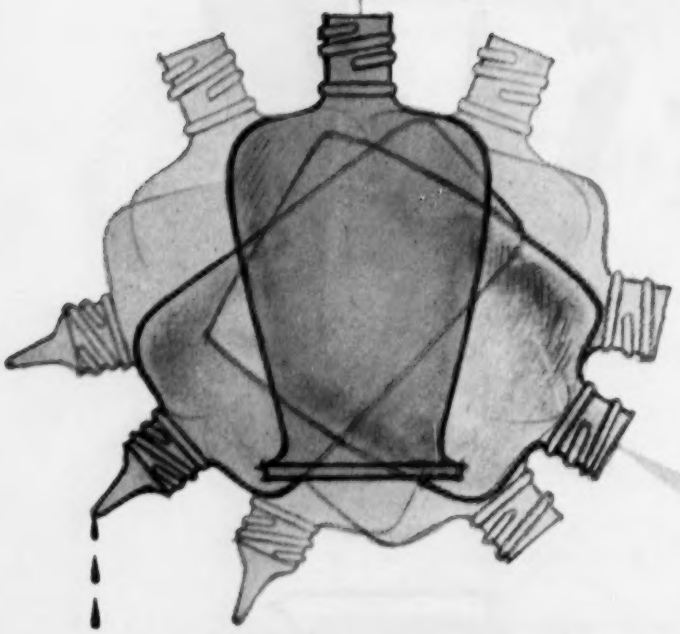

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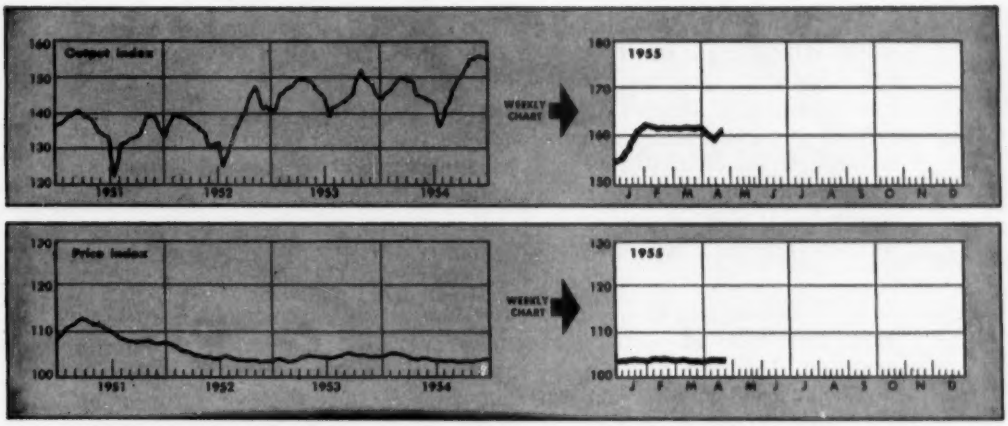
MARKETS . . . . . .



WEEKLY BUSINESS INDICATORS	Latest Week	Preceding Week	Year Ago
CHEMICAL WEEK Output Index (1947-49=100)	162.3	161.4	145.0
CHEMICAL WEEK Wholesale Price Index (1947=100)	104.2	104.1	104.4
Stock Price Index of 13 Chemical Companies (Standard & Poor's Corp.)	400.6	392.2	293.7

MONTHLY INDICATORS—Wholesale Prices (Index 1947-1949=100)	Latest Month	Preceding Month	Year Ago
All Commodities (other than Farm and Foods)	115.6	115.7	114.2
Chemicals and Allied Products	106.9	107.1	107.4
Industrial Chemicals	117.5	117.4	117.9

MARKET LETTER

As far as actual price changes go, the nation's marketplace has been relatively lethargic of late. A few days ago, however, some excitement was generated when one producer quietly initiated cuts on a couple of chlorobenzene products. Mono was reduced 1½¢/lb., paradichlorobenzene dropped 2¢.

Last tag change on the latter occurred nearly two years ago (when the just-sliced 16½¢ price was established), and mumbles in the trade today imply that the new move was, at the very least, "unnecessary."

The same is said for the mono, although calls for the material continue to be disappointing. That's in contrast with the high expectations earlier this year for a bubbling pep-up in demand, especially for DDT production.

Despite the unpopularity of the lower schedules among sellers, it's pretty certain that by this week industry standards for delivery in the East will read: paradichlorobenzene, 14½¢/lb. (drums); monochlorobenzene, c.l. in drums, 10¢. Prices slightly higher in the West.

•

You needn't travel far in the aromatics field to hear some vociferous comment, too, about benzol market activities. Nub of the grumbling here is the reported offering of a sizable quantity of imported material at about 4¢/gal. under the domestic quote for coke-derived product. Benzol demands from most consuming outlets continue at a brisk pace, even though output is up because of record-reaching steel operations.

Thus with the market perched on a firm supply/demand balance, benzol sellers might be expected to be happy about the future—but they're not. Apparently shaping up are factors similar to those which just a few months ago (*CW Market Letter, Jan. 8*) toppled the domestic price to the current 36¢/gal. level. Competition from the undercutting foreign-origin material is the chief worry, but anticipation of an increase in supply of both coke-oven and petrobenzene is also plaguing the more pessimistic observers. It may not happen soon, but some of them envision a downward revision in price schedules—perhaps as great as the previous lop.

•

Toluol, too, is engendering some concern among marketers—the term "more than adequate" is used more frequently to describe the supply condition. Total output—especially of the coke-oven product—has been somewhat greater, since last fall, than the combined needs of government and industrial outlets. But until now, this surplus hasn't been great enough to warrant worry. Reason: consumers' calls have held up better than many had anticipated.

Continued increase in production, plus some easing in demand, may well contribute to a backlog buildup, but it will probably not be as serious as some in the trade predict. One optimistic counterpoint: there's little, if any, speculation that prices in general will be shaved.

•

Word is getting around that there's a buildup of spot stocks of ammonium sulfate in a few producing areas. That goes for both coke-oven and synthetic material. Contract sales, on the other hand, are up to par.

Behind the accumulations of spot material at shipping points, say observers, is the late start in consumption. These "reserves" haven't reached the worrying-about level, and chances are they won't. Consensus seems to be that the amounts now available will be absorbed within the next few weeks—as spring use picks up.

•

Potential customers for Du Pont's Mylar polyester film are being offered further inducement to buy. For the second time since the company's Circleville, O., plant began turning out commercial quantities (last fall), tags have been cut—this time by 35¢/lb. That covers all types and gauges except the thinnest, the 25-gauge.

The new quotes put the film in a $2.40-$4/lb. price range.

•

No changes in sight. That seems to sum up price and demand outlooks on ethyl alcohol. Solvent requirements, as well as uses in pharmaceuticals and chemicals, are at fairly good levels, but production is ample to cover all calls.

SELECTED CHEMICAL MARKET PRICE CHANGES—Week Ending April 25, 1955

DOWN

	Change	New Price
Carnauba wax,, No. 3, Ceara, refd., pure, bags, ton lots	.03	$ .70
Monochlorobenzene, tanks, frt. alld. or deliv. E.	.015	.085
Nitrogenous process tankage, bulk, works, unit ton	1.00	4.25
Paradichlorobenzene, drums, c.l., frt. alld., E.	.02	.145
Propane, industrial ,tanks, group 3, gal.	.005	.02

All prices per pound unless quantity is stated.

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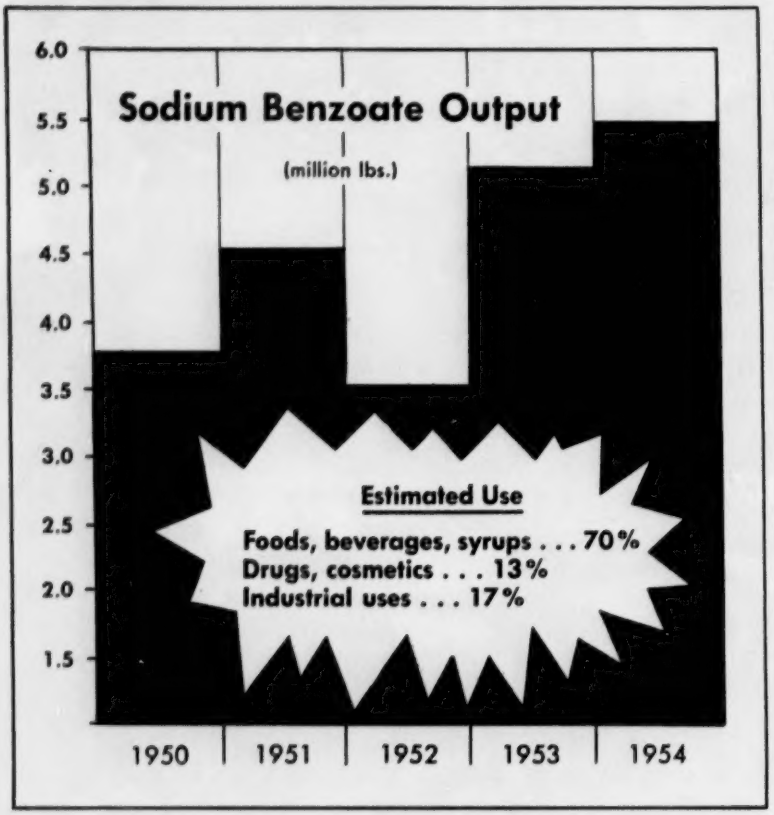


Benzoate Threats Brewing

Sodium benzoate producers*, striving for an output of 5.5 million lbs. this year, may soon have to do some fast stepping to counter two threatening market deflators on the horizon. The looming cut in consumption could be brought on by these developments:

- Possible dumping on the market, by the government, of surplus stocks of butter.
- Switch by chief benzoate consumers, oleomargarine makers, to using smaller amounts of benzoic acid in wrappers instead of benzoate in the spread itself.

Oleomargarine output may be set back temporarily if the U.S. government dumps large-scale quantities of surplus butter into regular markets. Margarine producers are vociferous in claims that they would be particularly vulnerable if the surplus is sold at a subsidized, competitive price.

About 75-80% of the margarine industry uses 0.1% sodium benzoate as a preservative, but the compound is kept out of butter by federal statute. An estimated turnout of 1,310-1,350 million lbs. of margarine this year will absorb about 1 million lbs. of the benzoate of soda. Besides inhibiting growth of enzyme-producing microorganisms, the benzoate retards rancidity without affecting the vitamin content of oleomargarine.

The second market threat to sodium benzoate in margarine is being pushed by at least one large food processor. This company demonstrates that mould spores are rarely found in clean margarine, but must enter through the package wrapper. Following up this idea, the concern is now selling its margarine, without sodium benzoate, in a parchment wrapper lined with aluminum foil. The wrapper contains a few milligrams of benzoic acid. Savings from the switch alone are said to amount to $50,000/year for this company.

Of a total estimated food usage of 2.5 million lbs. of sodium benzoate (*see end use box, p. 80*) margarine is the largest individual user. The remainder is dispersed—often with benzoic acid—among a wide array of other foodstuffs: fruit preserves, jellies, pickles, sirups, fish, frozen foods, molasses, fresh sausage, mince meat, relishes, honey.

Beverage makers, too, in an effort to minimize the risk of deterioration by microorganisms, dispense close to 1.5 million lbs. of benzoate of soda in soft drinks, cider, orange juice, fountain sirup, fruit flavors, etc. About 0.05% sodium benzoate preserves bottled carbonated fruit beverages satisfactorily.

Pharmaceutical Check: As in foods and beverages, drug and cosmetic compounders also depend on the benzoic salt to prevent deterioration in certain products that have a vegetable oil or gum base or that contain a sugar sirup.

Benzoate's bacteriostatic action in mouthwashes, antiseptic solutions, toothpastes, etc., makes a place for it on druggist's shelves, too. Shelf-companion cosmetic products in which benzoate may check deterioration include various lotions, emulsions and creams.

In drug compounding, sodium benzoate is meeting stiff competition from the *p*-hydroxybenzoates. Reason: the latter don't have the bitter flavor of the benzoate, and are effective in neutral solutions as well as in acidic media. Sodium benzoate, by comparison, is effective in acidic solutions, much less so at an alkaline pH.

Beyond the specific food, beverage and drug outlets, there's a tidy amount of benzoate added to various manufactured products exempt from the Food & Drug Act. In these the benzoate of soda is not identified in the product, often represents a trade formula secret.

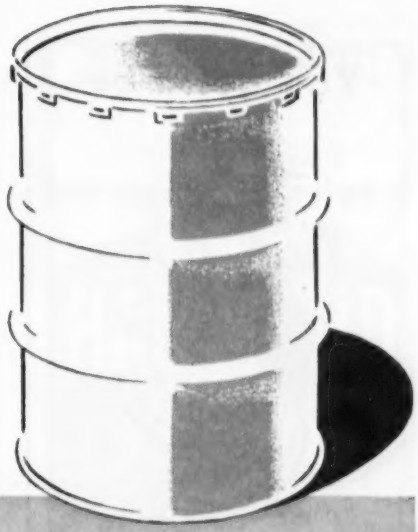
Likewise, in industrial applications (*see end use box*), it is fairly hard to pin down usage of technical grade sodium benzoate because of its ubiquity in intermediates. Major one, though, is benzyl benzoate (however, not all of it is made with the sodium salt as raw material). This ester is used as a fixative for flavors; useful solvent for more difficult soluble ingredients of perfume; as a miticide.

Preservation Redefined: There's also

*Major U. S. producers are Heyden Chemical, Hooker Electrochemical, Monsanto Chemical, and Tennessee Products & Chemical. Others are Mallinckrodt Chemical, Merck, New York Quinine & Chemical, Seydel Chemical.

Harshaw

Sodium Methylate SPEC 101



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Free Flowing white hygroscopic powder

Sensitive to air and moisture

Packs 4.6 pounds per gallon

Formula $NaOCH_3$

Formula Weight 54.03

CHEMICAL ANALYSIS

Sodium Methylate Typical 97.5%	Methanol Free 0.5
Sodium Hydroxide 0.5	Soluble in Methyl Alcohol
Sodium Carbonate 1.2	Decomposed violently by water
Sodium Formate 0.3	

Standard 95.0% min.

also available

Sodium Methylate Liquid

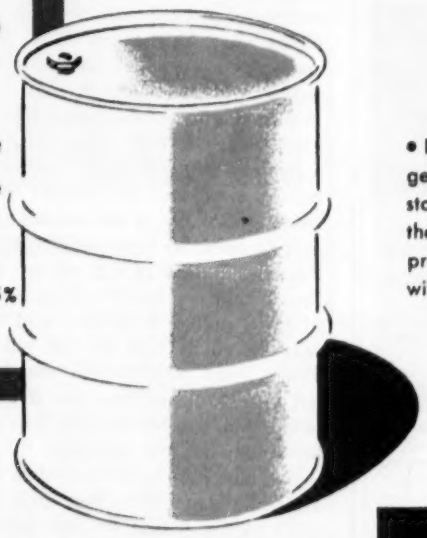
SPEC 102

Packaged in Steel Drums 425 pounds net

25% solution of sodium methylate in methanol

Analysis:

Sodium Methylate Content 24.5 to 25.5%



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MGK McLAUGHLIN GORMLEY KING Company

4719 S. E. FIFTH STREET / MINNEAPOLIS, MINNESOTA

Estimated Sodium Benzoate Use
(million lbs.)

Foods (margarine, pickles, preserves, jellies, fish, etc.)	2.2-2.5
Beverages (carbonated, cider, orange juice, flavoring sirup, etc.)	1.4-1.5
Drug compounding (elixirs, sirups); cosmetics	0.6-0.8
Industrial uses, captive consumption	0.8-0.9

a broad sense in which benzoic acid and its sodium salt has preservative action. The two are able to retard rancidity and darkening of color. Application has been in adhesives, casein emulsion stabilization, rubber latex, and soap.

In some cooling systems a recommended 1.5% sodium benzoate serves as a corrosion inhibitor. Corrosion of chlorinated-solvent vapor degreaser equipment has also been slowed by the salt. Metal parts—as in containers for water-based paints—are protected by applying a strippable rubber latex coating containing sodium benzoate.

Current upswing in benzoate output is attributed to some top-flight marketing ideas sold to benzoate producers and consumers. Demonstrations have shown definitely that control of moulds, yeasts and soil bacteria spells profits. Add, too, the convincing persuasion of dollar savings in many foodstuffs preserved by aid of the benzoate.

The chances, though, of a dip in sodium benzoate food usage are high. Besides the *p*-hydrobenzoates, which have a greater fungistatic activity, sorbic acid will also be a competitor. And the new twist of putting other preservatives in margarine wrappers—skirting FDA restrictions—may turn the dip into a gradual decline in USP-grade usage of sodium benzoate from here on in.

Sulfur Lift in Sight

You'd never draw the same conclusions studying sulfur statistics to date, but seasoned trade followers are predicting that, by the end of the year, consumption as well as production records will have been toppled.

Domestic use of the polymorphic material—particularly in making sulfuric acid, paper and pulp, carbon bisulfide, steel, etc.—is expected to increase noticeably, if not substantially. And to meet the prospective push by customers, output of U.S. sulfur (both Frasch and recovered) seems certain to hit 6 million long tons, and may possibly go as high as 6.2 million. That's some 300-400,000 tons over last year's 5.87 million, almost a full million tons greater than the 5.34 million turned out five years ago.

Actually, Bureau of Mines data now available gives little hint that this year's total may head for new heights. Production for the first two months was down a near-60,000 tons, compared with the Jan.-Feb. '54 aggregate. Output in March, too, though government figures haven't yet been compiled, shows every sign of dragging down, even more, the final first quarter total.

Then why the optimism among prognosticators for a full-blown '55? Basically, the sulfur skiagraph seems to underscore the anticipated higher levels of general business activity. Used so widely as a raw material, sulfur often mirrors the pattern of industrial and agricultural tempo.

Historically, said Freeport Sulfur's Vice-President John Carrington recently, the rate of increase in sulfur consumption in the U.S. has paralleled the advance in general industrial activity. Over a long period of years the average annual rate of increase has been about 3%.

As far as sulfur consumption is concerned, the percentage could go higher. Here's why:

- Sulfuric acid use this year is tabbed to outpace '54's 14-million-ton-total because of the anticipated briskness in a gamut of outlets, chiefly chemicals manufacture, paints and pigments, some fertilizers. (The acid maw will account for a good-size chunk of the available sulfur: currently approximately 80% of the sulfur consumed in the U.S. is burned to make sulfuric.)
- Carbon bisulfide, another big

brimstone taker—some 1,700 lbs. is required for every ton of bisulfide produced—is slated to reverse last year's use decline (to 476.5 million lbs. from '53's 501 million). Reason, primarily, lies in the continuation of the present heartening pickup in rayon production (*CW Market Letter, April 23*). Then too, cellophane, another big bisulfide user—last year it took some 73 million lbs.—will likely check out the year at a production rate impressively close to 320 million lbs.

• Pulp and paper is due for another hike, enough to take perhaps 8% of the sulfur to be sold this year.

There are more, of course, but these principal indicators seem ample enough to insure a high level of activity in the industry.

Limestone on the Move

FULL-SCALE production, just begun at U.S. Steel's Michigan Limestone Division quarry at Cedarville, Mich., serves this week to focus attention on the current consumption outlook for limestone. If market indications hold true, 1955 may well be termed the "year of the limestone comeback."

Take agricultural uses, for example. From a 22-million-tons/year level stretching back to '52, consumption this year is slated finally to edge up, perhaps by some 2-3 million tons.

Use in pig iron and steel, too, may undergo an 8-9-million-ton increase over '54's 33.4 million, surpass '53's impressive 39.7 million to rack up a banner near-42 million tons. And the traditional top user of limestone, construction (concrete, road building materials, etc.), is expected to swallow another whopping 95-100 million tons by the end of the year.

Although output from U.S. Steel's new 3-million-tons/year capacity quarry will be chiefly captive, it will contribute to the record total to be consumed in this country in '55—at least 275-300 million tons, which is just about double the pre-Korea quantity.

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IN VIEW: Carbide's new acrolein plant. Not in view: years of development.

Harnessing a Hazard

Triumph for chemical development: researchers discover way to sidestep risky properties of acrolein, long a monumental barrier to its large-scale commercialization.

Dozens of derivatives, special handling techniques, plentiful availability many turn the trick, may place acrolein's name on the list of major bulk chemicals.

If there ever was a challenge to commercial chemical development, acrolein is it. Few chemicals have matched its promise, its scope of reactivity. Conversely, few have offered so many obstacles to successful commercialization.

Within the past fortnight, however, news from two different chemical companies indicates that most obstacles have now been surmounted, that acrolein will soon make a strong bid to become a fundamental chemical building block—as useful as acetylene or ethylene oxide:

• Carbide and Carbon Chemicals Co. has shipped the first tank-car quantity of an acrolein derivative, hexanetriol-1, 2, 6 from its new, multimillion-pounds/year plant at Institute, W. Va. Carbide is just about ready to go onstream.

• Shell Development Co. will construct an acrolein plant to supply the aldehyde to outside users and to its contemplated glycerine plant.

Acrolein has long fascinated chemical development men. Comprised of two highly reactive groups—olefinic and carbonyl—on a three-carbon chain, the chemical enters most reactions associated with each group. Halogens, mercaptans, organics with "active" hydrogen, halogen acids, and water add across the double bond; anhydrides, Grignard reagents, and hydrogen cyanide react with the carbonyl group. Diels-Alder reactions and Skraup-type condensations are also part of acrolein chemistry. All in all, the literature abounds with over 800 acrolein derivatives.

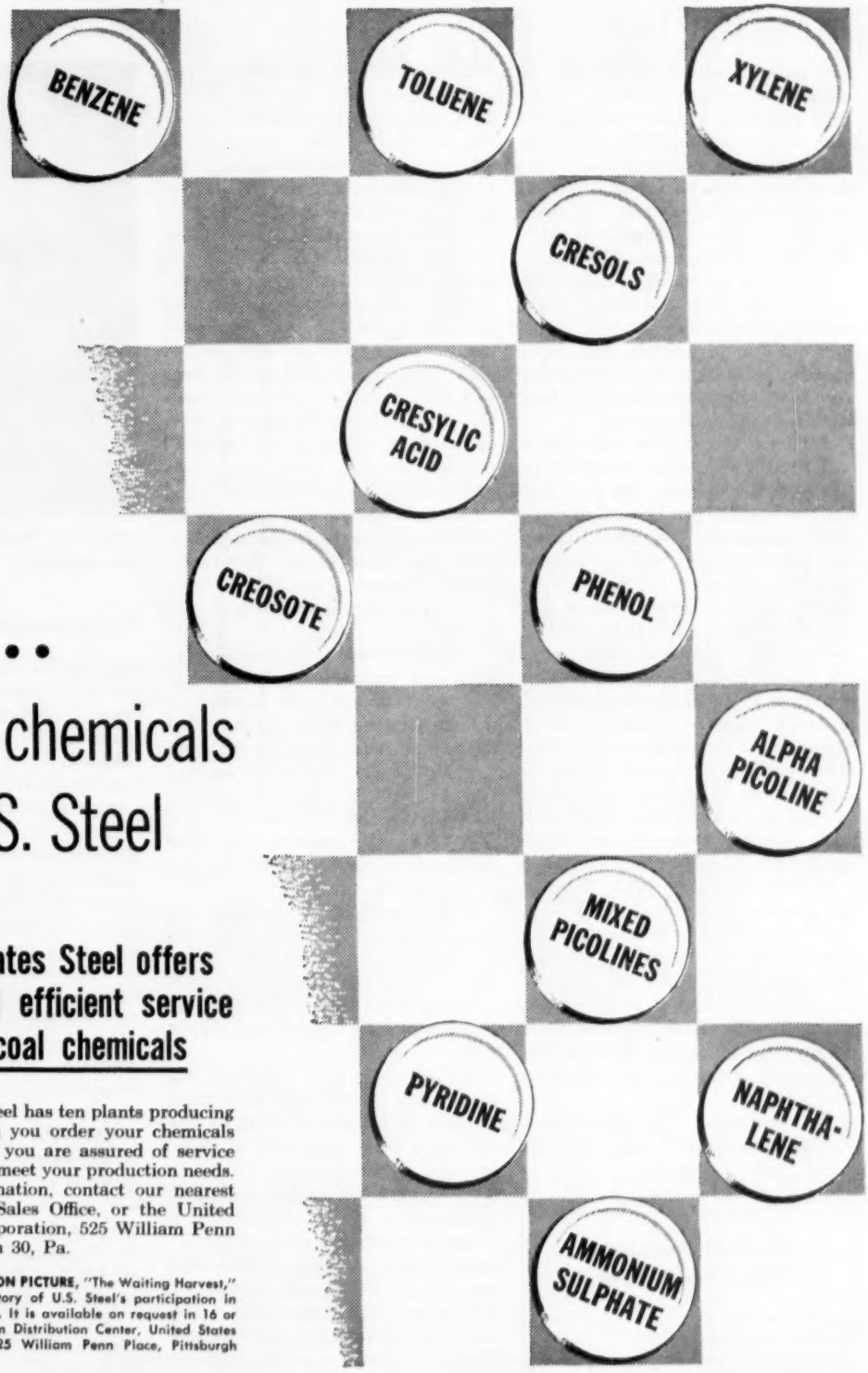
But if acrolein's reactivity was a lure to its commercialization, it was also a formidable roadblock. More toxic and irritating than chlorine, the highly flammable compound readily polymerizes* with strong evolution of heat. Add its high vapor pressure at room temperature and you come up with a deadly material that necessitates painstaking handling.

The hazardous nature of acrolein undoubtedly contributed to the reluctance of the chemical industry to develop large-scale uses for the chemical when it was first commercially offered in 1946. But price and limited availability were also important factors. As Richard W. Eddy, product manager for acrolein in Carbide's fine-chemical section, puts it, "It's not enough to offer a new chemical; it has to be priced to stimulate widespread evaluation." Thus the stage was set for a long-term development program. Both Shell and Carbide plunged in.

Chemists, market researchers, literature chemists and others set to work. By 1946, Shell (which began experimentation in the early '30s) was operating a semicommercial acrolein unit. Now, Shell claims to have over

* Polymerization can be caused by heat, light, air, bases, and some catalysts, but can be inhibited by small amounts of hydroquinone.

CARBIDE'S EDDY: 'The price must stimulate evaluation.'



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A NEW COLOR MOTION PICTURE, "The Waiting Harvest," tells an interesting story of U.S. Steel's participation in the field of chemicals. It is available on request in 16 or 35 mm film from Film Distribution Center, United States Steel Corporation, 525 William Penn Place, Pittsburgh 30, Pennsylvania.

See "THE UNITED STATES STEEL HOUR"—Televised alternate weeks—Consult your newspaper for time and station.

USS Coal Chemicals

USS

UNITED STATES STEEL

150 patents granted or pending on acrolein chemistry. Carbide began pilot operations in late 1946, reached tank-car lots in mid-1949. Researchers at Carbide prepared more than 400 derivatives, including about 80 unrecorded in the literature. A product of this work, a reference booklet, lists over 130 literature references.

Now well advanced, development work should soon yield a hefty sales harvest. To sidestep the poor handling qualities of acrolein, both firms plan to offer numerous derivatives (*see box*). Here, for example, is how Carbide will vend acrolein:

• Direct sales: The sales effort will stress the extreme versatility of the olefinic aldehyde: the fact that one raw material can be used to make many compounds. Company officials and salesmen (who will get special training) will point out to potential large-volume consumers that it will pay to go to the effort to install special acrolein equipment, train workers, institute handling techniques, etc. And, potential customers will be invited to inspect Carbide's handling techniques. A comprehensive brochure has been prepared, covers in detail necessary handling precautions, as well as acrolein chemistry. Naturally, customer service, too, will figure significantly in sales plans.

• Derivative sales: This phase of the program is the heart of the solution to the problems in using acrolein directly. Basic philosophy: you can sell acrolein just as well—if not better—as a nonhazardous derivative as you can in the pure state. Selling acrolein in this form proffers the attractive advantage of selling an upgraded product.

To implement this sell-acrolein-through-derivatives program, Carbide has worked out preliminary cost estimates on more than 100 derivatives; has eight available in tank-car lots on "short notice"; has some 30 others in nine classifications* in advanced development stages (development quantities now being offered); stands ready to make almost any other acrolein chemical that a customer would order in commercial quantity.

Who will use acrolein and who will use derivatives? Although some smaller concerns may use acrolein itself, Eddy expects most smaller firms will find derivative use more feasible. Larger chemical producers, however, will likely lean to the "straight" product. But even here, those companies that followed the recent trend to versatile-equipment types of installations will probably choose derivatives rather than convert. Eventually, Eddy estimates, about 50% of acrolein production will be sold as derivatives.

Market Pattern: With sizable quantities now becoming available, acrolein consumption will assume a definite pattern. Eddy envisions that the market may shape up this way:

• Methionine. This could account for the bulk of "straight" acrolein sales in the next few years.

• Textile chemicals. Acrolein and derivatives could find substantial use in various resin finishes.

• Pharmaceuticals. Acrolein in amino acid synthesis, and derivatives in many pharmaceutical intermediates.

• Polyurethanes, polyester resins, plasticizers. Both acrolein and derivatives.

• General organics. This will be a main outlet for acrolein derivatives. Because of inherent versatility, they will likely enter most fields of chemistry.

At this still-early stage in acrolein development, market forecasting is of course somewhat conjectural. It's quite possible, Carbide believes, that many applications, still unexplored, will prove highly significant. This much, however, is now certain: both Shell and Carbide agree that commercial chemical development has racked up an impressive achievement in harnessing a rambunctious chemical for industrial application.

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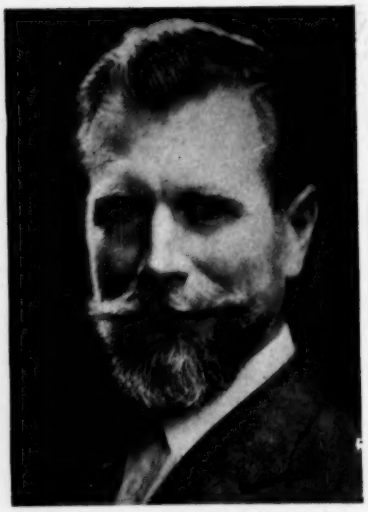
* Currently available from Shell Development Co. and Carbide and Carbon Chemicals Co.

* Substituted pyrans, monomers, dialdehydes, diols and polyols, alcohols, amines and aldehydes, cyano derivatives, chlorine compounds, and acids and anhydrides.



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Commander Edward Whitehead, president and sales symbol of Schweppes (U.S.A.) Ltd.—a case in point—gave chemical salesmen something to think about when he met with a group of them in New York last fortnight.

As salesman extraordinary, it was his job to convince the public that lower prices for Schweppes mineral waters and tonics did not imply a downgrading of quality—that the products were identical with those it previously sold only as expensive, connoisseur specialties. To do this, the commander performed in many roles.

• As "The Man from Schweppes" he introduced the product with the authority of an insider.

• As "The Man with the Briefcase," stepping from a trans-Atlantic plane, he dramatized the transfer (from England) of the original manufacturing secrets to the U.S. bottler (Pepsi-Cola).

• As "The Commander" he secured attention.

• As "The Man with the Beard" he symbolized uniqueness—but with dignity and distinction.

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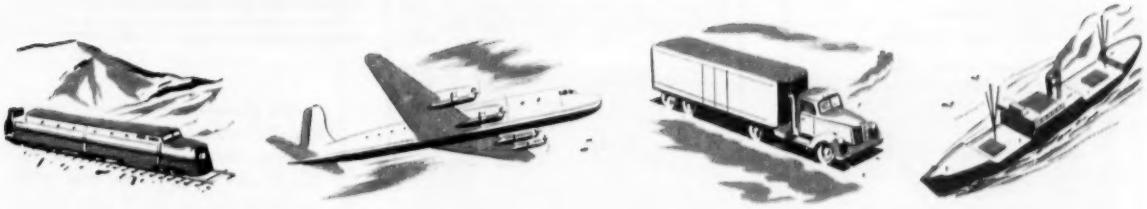

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FACT-FINDER PAGE: His report urges less ICC rate-fixing authority.

New Transport Rules?

The long-stalled report of the Administration's Cabinet transportation committee was last week released by the White House. Watered down somewhat from the version that was "leaked" (*CW, April 9, p. 64*), the committee's suggestions would profoundly alter the rules under which rails, trucks, barges and boats operate.

The Cabinet committee's recommendations are based on the findings of a working committee headed up by Arthur Page, former vice-president of the American Telephone & Telegraph Co.

Very broadly, the committee recommends that all forms of transportation be given more freedom to compete pricewise by making it easier for carriers to raise or lower rates.

Specifically, Interstate Commerce Commission power to regulate rates would be relaxed. Now, ICC has authority to approve or disapprove rate changes irrespective of transport trends. The new proposals, for example, would let railroads and barge lines cut rates on long hauls—a practice now restricted. And the period for which ICC could suspend proposed new rates would be clipped from seven to three months. ICC would retain power to fix maximum and minimum rates, but neither the agency nor the carrier could set rates below actual costs.

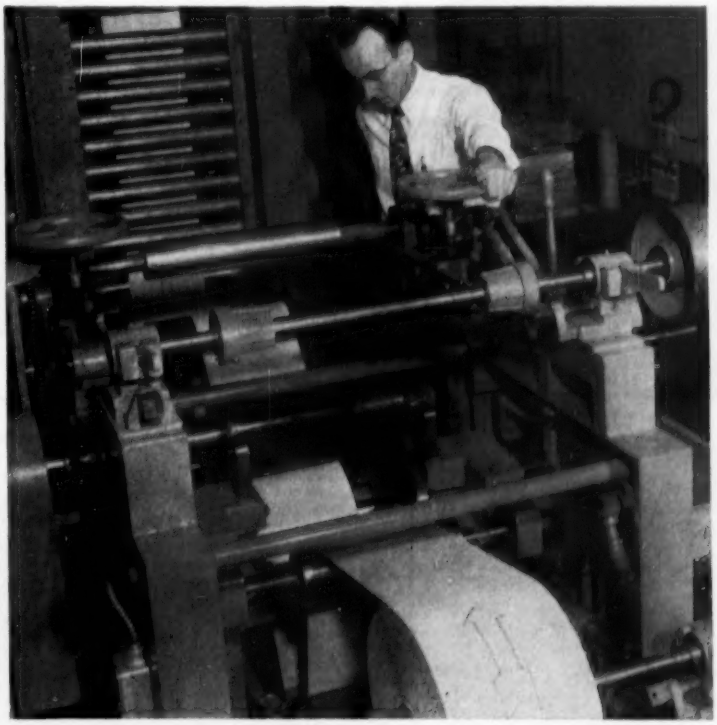
Other gains for the railroads appear evident from the proposals: water carriers would lose their present exemption permitting setting of special rates on bulk commodities without ICC okay; contract carriers would be prohibited from performing common-carrier service at less than common-carrier rates.

Although the suggestions are generally held to be a major victory for rails, the victory is no shutout. Provisions damaging to other forms of transport, present in the "leaked" version of the report, have been dropped from the final draft. These include a proposal that users of inland waterways pay toll charges and that railroads be free to enter the trucking business.

Outlook for adoption of the committee's recommendations is cloudy. Presidential approval of the report is lacking; Democrats control committees, will dally in committing themselves; hearings are not likely this year; most proposals require new legislation; and truckers (particularly) and barge operators will fight hammer and tongs against new laws.

•

Safety First: "Before Hydraulic Fires Start" is the title of an industrial safety motion picture featuring Monsanto's Pydraul F-9 fire-resistant hydraulic fluid. Prints of the 16-mm., black-and-white, sound movie, which runs about 12 minutes, are available on request from Monsanto Chemical Co., (St. Louis, Mo.).



Wax Machine Smooths Service

CUSTOMER SERVICE—stepped up to the tempo of a $110-million annual wax business—explains the installation of a paper waxing machine in the Esso Research Center (Linden, N.J.).

The equipment is a small version of the machines used by paper manufacturers and convertors; it will enable Esso researchers to prepare test batches of waxed paper under varying experimental conditions, including temperatures up to 250 F.

Offbeat CMC Pitch

Hercules Powder Co. now lets CMC stand for "companies must cooperate," points to stream pollution and civic pride when battling the stiff current of established competition in the cotton size market. CMC (carboxymethyl cellulose) is said to be an answer to waste disposal problems and a stepping stone toward good public relations.

With emphasis on the growing public awareness of its right to enjoy the natural water resources, Hercules argues the need of realistic pollution abatement programs in anticipation of more rigid controls by regulatory agencies. Because a textile plant is apt to be located on a small stream, the adjustment of organic waste loads to the capacity of the stream may become a complex and costly problem.

Throughout the years, starch has been a size for cotton to provide strength and protection to the yarn during the weaving operation and subsequent handling. Up to 60% of the stream pollution load is attributed to this starch, which becomes part of the total mill waste when the cloth is ultimately desized.

Starch has long been the favorite size for cotton because it is relatively cheap and it conditions the yarn satisfactorily. However, during the last few years, synthetic materials such as CMC have been developed.

To simplify the waste-disposal problem and ease the resultant economic burden on the textile companies, Hercules now plugs CMC as a cost-saving substitute for starch. Thus, by bolstering experimental data and cost statistics with an appeal for "good citizenship," the firm hopes to capture part of the cotton size market for CMC.

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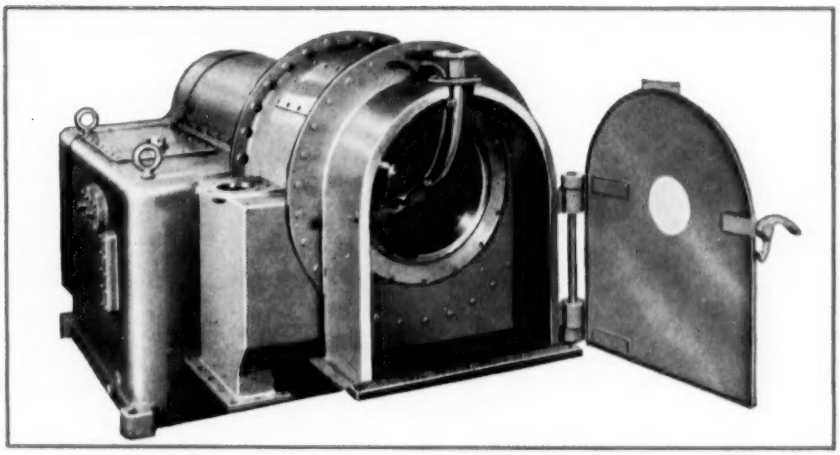

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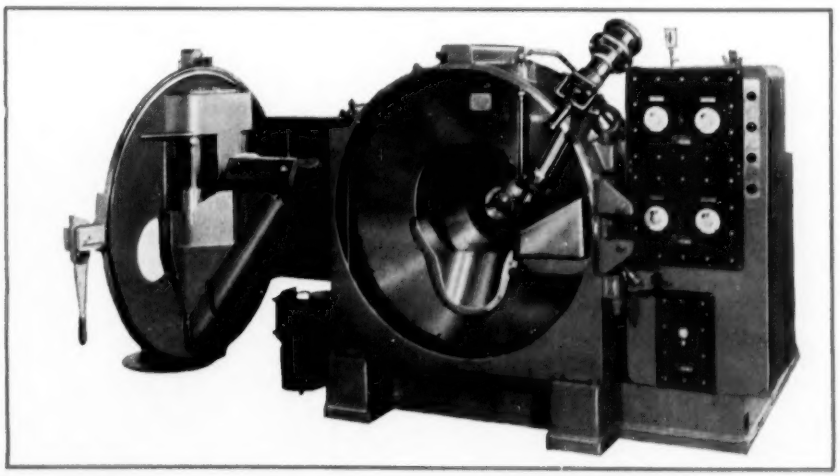

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